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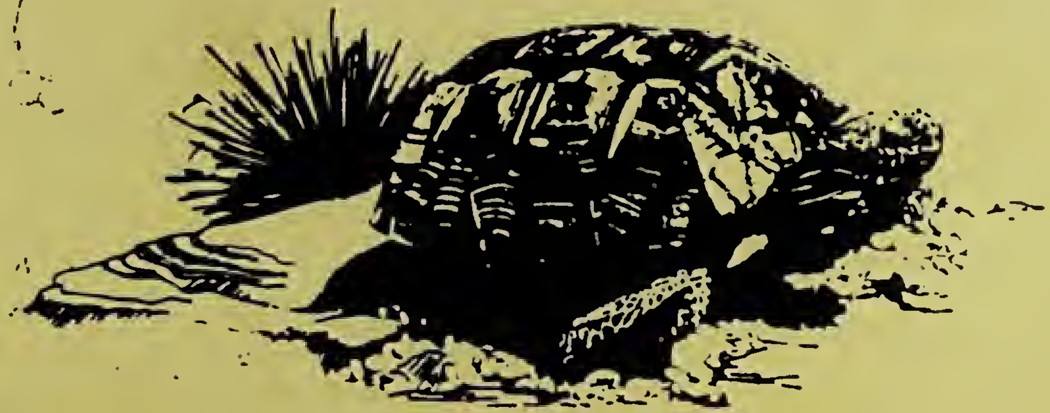
ANSWERING
QUESTIONS ABOUT
THE DESERT TORTOISE



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United States Department of the Interior

BUREAU OF LAND MANAGEMENT

CALIFORNIA DESERT DISTRICT
1695 Spruce Street
Riverside, California 92507

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JUL 07 1989

Instruction Memorandum CDD No. 89 - 95
Expires: 09/30/90

To: Area Managers

From: District Manager, California Desert

Subject: Responding to Common Public Inquiries about the Desert Tortoise

Each year, the Area and District Offices receive hundreds of telephone calls and visitors asking questions about the tortoise. With the increased attention on the tortoise, the requests for information have escalated. The attached binders, which were developed in close coordination with the California Department of Fish and Game, contain instructions on how to deal with frequently asked questions and situations. The most critical questions and issues are covered in the first nine pages. Please familiarize yourselves with the material and try to provide clear and consistent answers to the public on such critical issues as collecting wild tortoises and releasing captives to the wild. If you have questions, advise, or revisions, please call Kristin Berry at the District Office (FTS-799-6402, 714-351-6402). She, Ted Rado, and Barbara Maxfield will also be preparing single-page issue sheets on the subjects of disease, population trends, and the raven program in the coming weeks.

Each Area Office will receive two binders, one for the front desk and reception area, and a second for the wildlife biologist and resources staff. If you need more, please call Kristin Berry.

Attachments (2)

ACTING

Distribution:

WO	340	1
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Take pride in your California Desert Conservation Area . . .
A National Treasure.

ESSENTIAL INFORMATION ON DESERT TORTOISES FOR THE PUBLIC

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WHAT TO DO WHEN YOU FIND A TORTOISE...

The Desert Tortoise, our State Reptile, is in Trouble. Tortoise populations have been declining for decades because of collecting, vandalism, and loss of habitat. Government agencies have recognized the problems facing this species for many years. In 1939, 1961, 1972, and 1973 the California Fish and Game Commission developed special laws to protect wild tortoises from collecting, harassment, and shooting. In June of 1989, the Fish and Game Commission listed the tortoise as a threatened species under the California Endangered Species Act.

Federal agencies recognize the declines also. In 1980, the Bureau of Land Management listed the tortoise as a sensitive species because of its declining status. In 1985 the Fish and Wildlife Service officially determined that the tortoise deserves federal listing as a threatened or endangered species. Between 1985 and 1989, tortoise populations continued to decline precipitously in several parts of the geographic range. In response, three national conservation organizations--Natural Resources Defense Council, Defenders of Wildlife, and the Environmental Defense Fund--submitted a petition for emergency listing to the Fish and Wildlife Service in May of 1989. The Service will probably prepare a response during summer of 1989.

LAWS TO PROTECT OUR DESERT TORTOISES

Wild Tortoises. You must not take a desert tortoise from the desert. The tortoise is state-listed as a threatened species. Under the existing State regulations and California Endangered Species Act, you can be fined for collecting, harassing, shooting, harming, or purchasing a desert tortoise. The penalties include a fine of a maximum of $2,000 or a year in jail or both.

Captive Tortoises. In 1972 and 1973, the California Fish and Game Commission passed special laws to permit people who had collected desert tortoises prior to March of 1973 to retain possession of these captives. In doing so, the Commission recognized that many people had held tortoises in captivity for decades or had offspring of captive tortoises. Individuals with legal captives must have the tortoises registered with the California Fish and Game Department. The Department issues stickers similar to car license plate stickers for each captive tortoise.

If your captive was legally acquired, you must have a registration. To obtain a registration form, write to Ms. Terri Correll, who is the registration agent for the California Department of Fish and Game. Ms. Terri Correll's address and telephone number are:

California Turtle and Tortoise Club, Palm Desert/Springs Chapter
P.O. Box 4156
Palm Desert, CA 92261

Terri's phone number at Living Desert Museum is 619-346-5694 (Monday-Friday, 8:00 a.m. to 5:00 p.m. only).

IF YOU FIND A TORTOISE WHILE IN THE DESERT...

What to do if you see a tortoise crossing the road. If you travel in the Mojave or Colorado deserts in spring, late summer or fall, you might see tortoises crossing dirt or paved roads. Such tortoises are likely to be crushed by vehicles, because they don't try to escape. When frightened, they withdraw into the shell and remain motionless, and are likely to be hit by an oncoming car.

Stop your car in a safe place at the roadside and retrieve the tortoise. Note the direction the tortoise was heading. Carry it carefully across the road in the same direction, and take it into the desert for a few hundred yards. Carry the tortoise upright, in its normal walking position. Don't tip it from side to side or upside down. If the tortoise becomes frightened, it may empty its bladder as a defense mechanism. The loss of bladder fluids can place the tortoise under additional stress, because tortoises store water in the bladder for use during the dry times of year.

What to do if you find a tortoise injured on the road. Sometimes tortoises hit by vehicles are still alive. They may have been hit a glancing blow, cracking the shell, or received a similar minor injury. In southern California, there are several dozen veterinarians with expertise in caring for injured tortoises. Some tortoises can be rehabilitated and then returned to their homes. If you accidentally injure a tortoise or find an injured tortoise, please contact a veterinarian. The following list of recommended veterinarians was provided by the California Turtle and Tortoise Club:

Ted Adler, DVM
16911 Roscoe Blvd.
Sepulveda, CA 91343
(818) 893-6366

Patty Boge DVM
Jeanne Freidman, DVM
Narbonne Animal Clinic
25445 Narbonne Avenue
Lomita, CA 90717
(213)-325-5850

Sherry Brothers, DVM
Highland Ave. Vet. Clinic
1731 E. Highland Ave.
San Bernardino, CA 92404
(714)-889-0093

Fredric Frye, DVM
Davis Animal Hospital
1617 Russell Blvd.
Davis, CA 95616
(916)-756-1766 and
Sacramento Anim. Med. Group
4990 Manzanita Avenue
Carmichael, CA 95608

Murray Fowler, DVM
University of California
Davis, CA 95616

James Gray, DVM
Ventura Veterinary Hospital
1784 Thompson Blvd.
Ventura, CA 93001
(805)-648-2797

Charles Jenner, DVM
Rossmoor-El Dorado Anim. Hospital
10832 Los Alamitos Blvd.
Los Alamitos, CA 90720
(213)-598-8621

Richard Johnson, DVM
Central Veterinary Hospital
Upland, CA
(714)-981-2855

Kechen Chang, DVM
SeaGate Vet. Hospital
16061 Bolsa Chica Road
Huntington Beach, CA 92649
(714)-846-4436

(916)-331-7430

Ronald Ridgway, DVM
North Park Veterinary Hospital
4054 Normal Street
(619)-299-6020

Richard Shackleford, DVM
2695 E. Foothill Blvd.
Pasadena, CA 91107
(818)-792-5143

Walter Rosskopf, DVM
Avian and Exoitic Anim. Hospital
4871 W. Rosecrans Ave.
Hawthorne, CA 90250
(213)-679-0693
AND
Avian and Exotic Anim. Hospital of Orange County
10661 Ellis Ave. #C
Fountain Valley, CA 92708
(714) 963-8930

Randy Strathman, DVM
Orange Olive Veterinary Hospital
2187 Orange-Olive Road
Orange, CA 92665
(714) 998-1510

The injured tortoise should be transported to a veterinarian and hopefully rehabilitated. Remember, though, that it is illegal to possess a wild tortoise. If you take an injured tortoise from the desert for humane reasons, you should immediately contact the Department of Fish and Game:

James St. Amant or Frank Hoover
California Dept. of Fish and Game
Fish and Wildlife Base
4775 Bird Farm Road
Chino, California 91709
(714)-597-8235, or 597-1521

You should not use the injury as a means of obtaining a pet. For example, do not take healthy three-legged tortoises from the wild. Tortoises with only three legs can do quite well in the wild. Even two-legged tortoises have been known to survive!

HOW TO PROTECT TORTOISES WHEN YOU VISIT THE DESERT

When you are hiking, camping or having a picnic in the desert, you might see tortoises. Please do not handle them, because they may release the contents of their bladders. Tortoises store water in the bladder and can reabsorb it during dry seasons. The loss of water may place them under unnecessary stress or contribute to early death. Enjoy the tortoise at a distance, or move close to it slowly with your camera. Do not try to "pose" them for a picture. If you are lucky, the tortoise will approach you out of curiosity and may sit in your shade. Check under your car before driving away. Often a tortoise will seek the shade of a car and be under the wheels.

WHAT TO DO WHEN SOMEONE TAKES A TORTOISE FROM THE DESERT

Some of us know people who have taken a tortoise from the desert. **If the tortoise was collected prior to 1973 and has been a captive since that time or is the offspring of such captives, the owner may possess it with a special permit** (see section on captive tortoises). If, however, the collector has recently taken the tortoise from the desert, a state law has been violated, and the collector is liable for prosecution. You may call CALTIP at 800-952-5400, a special telephone number of reporting illegal collecting and poaching. If the violator is apprehended, you may receive a reward. Be assured that you can remain anonymous.

If the tortoise was collected a few days earlier and if the tortoise was held in isolation (e.g., in a cardboard box, no other captive tortoises or turtles present, and was not placed in a yard or with any domestic pets), then Jim St. Amant or Frank Hoover, tortoise experts for the California Department of Fish and Game, may decide that the tortoise can be returned to the **exact location** from which it was taken. The subject is a very difficult at this time, because of the potential for spreading a highly contagious and fatal respiratory disease (contagious to tortoises) in wild tortoise populations. You should not make this decision yourself or even with a ranger or warden. Biological expertise is essential. Immediately contact:

Jim St. Amant or Frank Hoover, Tortoise Management Team
California Dept. of Fish and Game
Fish and Wildlife Base
4775 Bird Farm Road
Chino, California 91709
(714)-597-8235, or 597-1521

If you cannot reach Jim St. Amant or Frank Hoover, call Kristin Berry or Ted Rado at the Bureau of Land Management, California Desert District Office in Riverside. The government agencies may alter the official position on this topic as more information becomes available on contagious diseases.

If wild tortoises have been held in captivity in the presence of other tortoises or turtles, they must not be returned to the wild for any reason. A wild tortoise is held in captivity for even a few hours is likely to contract a disease. Examples include: contact with tortoises or turtles carrying diseases and contact with a yard where tortoises have been sick, even several years ago. One common disease of captive tortoises and turtles world-wide is a highly contagious respiratory syndrome, which is almost always terminal. As of this time, the respiratory disease is not curable. Some tortoises may carry the disease and not appear sick or the symptoms may disappear and then reappear. The disease apparently can remain in yards and infect tortoises brought to the yard. **REMEMBER: some diseases are highly infectious and fatal. Don't take a chance exposing our wild populations.**

In 1988-1989 wild tortoises with the upper respiratory syndrome were discovered at the Desert Tortoise Natural Area, in the Rand Mountains and Fremont Valley, near California City, and Kramer Junction. This infection is sweeping large parts of the population and causing extraordinarily high mortality rates. The disease was probably introduced to the wild population through release of one or more sick tortoises. Thousands of wild tortoises are dying from the disease.

In this particular situation, you should also call Jim St. Amant or Frank Hoover of the California Department of Fish and Game, as well as CALTIP 800-952-5400.

WHAT TO DO IF YOU FIND A TORTOISE IN A RESIDENTIAL AREA...

First, Try to Determine If the Tortoise is Captive or Wild. The location of the tortoise will give you an important clue. Tortoises found on the fringes of residential areas in desert towns (e.g., Barstow, Apple Valley, Victorville, etc.) are very likely to be wild tortoises. They may wander in and out of unfenced yards and along streets on the desert edge. Check the tortoise for paint or holes in the shell or a Fish and Game sticker (typical evidence of a captive). If the tortoise shows no such signs of having been a captive, it should be treated as a wild tortoise. If you find such a tortoise, pick it up carefully, keeping it in its normal, walking position, and carry it a few hundred yards to the desert edge. You will help to protect the tortoise by allowing it to remain as a wild animal.

Some people try to use "tameness" to determine whether the tortoise is wild or a captive. Tameness is not a good criterion, because there is such a wide variety of behaviors in both captives and wild tortoises. For example, many wild tortoises exhibit lack of fear and curiosity, and will walk up to a person, sniffing, and even stop to rest by him/her. In contrast, some captives are very shy, and will withdraw tightly into the shell when an observer approaches.

Tortoises found in many towns and cities away from the desert have most likely been captives for many years, often decades. Sometimes such captives have escaped from owners who have had them for 20 years or more. Sometimes they have been "owned" by many people. If the tortoise has a hole drilled in the shell or numbers or colors painted on it, it probably has been a captive for some time. If it has an official Department of Fish and Game sticker with a registration number, Fish and Game officials can locate the owners through the registration system. Over 20,000 captive tortoises live in residential areas in California (Bakersfield, Los Angeles, Riverside, San Bernardino, Long Beach, San Diego, etc.)

If you Find a Lost Captive Tortoise. Captives that have escaped their owners and are wandering the streets of a city or town are likely to be crushed by vehicles or killed by dogs. Please pick up the tortoise and call your nearest California Turtle and Tortoise Club Adoption Chairman. If the tortoise possesses an official registration number, the Adoption Chairman can determine the owner. If the tortoise has no sticker and the owner cannot be located, the tortoise will be taken by a representative of the California Turtle and Tortoise Club. A new home will be found for the tortoise, and it will be officially registered with the State.

List of California Turtle and Tortoise Clubs with Adoption Chairmen in Southern California and the Desert:

Westchester Chapter
P.O. Box 90252
Los Angeles, CA 90009

President: Cathy Berrett (213)-649-0578
Vice Pres.: Walter Allen (714)-962-0612
Sec/Treas: Betty Chambers (213)-670-5225

Foothill Chapter
P.O. Box 194
Montrose, CA 91020

President: David Kavanagh (818)-443-2112
Vice Pres.: Betty Caldarelli
(213)-863-2672

Orange County Chapter
P.O. Box 11124
Santa Ana, CA 92711

President: Martha Young-Wheeler
(714)-965-0395
Vice Pres.: Fred Caporaso (714)-559-0842

Inland Empire Chapter
P.O. Box 2371
San Bernardino, CA 92406

President: Jayne Chavez-Scales
(714)-792-7025
Secretary: Vendy Hall (714)-864-0978

Valley Chapter
P.O. Box 44152
Panorama city, CA 91402

President: Dr. Marc Graff (818)993-7441
Vice Pres.: Marilyn Goldenberg
(818)-887-9424)

WHY CAPTIVE TORTOISES SHOULD NOT BE RELEASED TO THE WILD

There are several reasons why domesticated or pet tortoises should not be returned to the desert. First, released pets are likely to have harmful affects on the wild populations. Pets often carry diseases and parasites, which may not be apparent with casual inspections. These diseases can and have infected wild populations. A prime example is the appearance of the highly contagious and fatal respiratory syndrome at the Desert Tortoise Natural Area in 1988 and in other parts of the western Mojave Desert in 1989. This disease, which is killing thousands of wild tortoises, was probably caused by unauthorized releases of sick captive tortoises. Released pets also may interfere with the social structure of existing populations. Wild tortoises have well-defined activity areas and often defend territories and burrows. The introduction of new tortoises to an area can stimulate fights for burrows, food, and other resources.

Second, recent research indicates that several genetically distinct tortoise populations exist. A tortoise from one genetically distinct unit should not be mixed with tortoise populations from another unit. Often, the pet owner does not know the source of the captive tortoise.

Third, studies indicate that domesticated tortoises do not have a high survival rate, probably because they have forgotten the intricate details of living in the harsh desert environment. Pets do not dig burrows as readily or as well as wild tortoises. Pets also may not remember how to forage.

Many wild tortoise populations are already threatened with loss and deterioration of habitat. The amount of undisturbed desert decreases yearly, usurped by construction, development, and other human pressures. The quality of remaining habitat is also decreasing, because of the many demands for land use: mining, grazing, off-road vehicle recreation, energy development, and uncontrolled trespass. Desert habitat recovers very slowly from disturbance. At the current rates, more habitat is being lost and degraded than is protected. As a result, tortoise habitat can support progressively fewer individuals. To release additional tortoises into such a situation increases competition and stress for the existing wild populations.

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HOW TO ADOPT A CAPTIVE TORTOISE FOR A PET

In 1974 the California Department of Fish and Game established cooperative programs with several organizations to facilitate the handling of captive tortoises people no longer want. The program includes the California Turtle and Tortoise Club, Tortoise Education Adoption Media, and several individuals. At no cost to the Department, members of these organizations treat injured or diseased captive tortoises and also find suitable people to "adopt" them. They also provide quarterly reports of their adoption activities to the Department. These private organizations have been instrumental in developing methods for breeding and rearing captive tortoises. They are experts in tortoise husbandry. They maintain lists of individuals who want to adopt desert tortoises and can provide a safe home.

Westchester Chapter
P.O. Box 90252
Los Angeles, CA 90009

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Vice Pres.: Walter Allen (714)-962-0612
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Valley Chapter
P.O. Box 44152
Panorama city, CA 91402

President: Dr. Marc Graff (818)993-7441
Vice Pres.: Marilyn Goldenberg
(818)-887-9424)

New chapters of the California Turtle and Tortoise Club are forming in the Bakersfield, Barstow, and Palm Springs areas. More information will be available on these chapters in the next year or so.

Kristin Berry
March 10, 1989

COMMONLY ASKED QUESTIONS ABOUT THE DESERT TORTOISE AND ANSWERS

1. What is the difference between a turtle and a tortoise?

In the United States the following distinction is made between the terms turtle and tortoise:

A **tortoise** is a land dwelling turtle with high domed shell and columnar, elephant-shaped hind legs. Tortoises go to water only to drink or bathe.

In contrast, the word **turtle** is used for other turtles: pond turtles, river turtles, box turtles, musk turtles, sea turtles, etc.

2. How many different kinds of tortoises occur in North America?

Three species of tortoises occur in the United States and a fourth is found in Mexico. The desert tortoise (Xerobates [Gopherus] agassizii) is found in the Mojave and Colorado/Sonoran deserts of California, southern Nevada, Arizona, southwestern Utah, and in Mexico. The Texas tortoise (Xerobates [Gopherus] berlandieri) occurs in southern Texas and northeastern Mexico. Some can be found in California, where they were sold in the past for pets. The third U. S. species is the Gopher or Florida tortoise (Gopherus polyphemus), which lives in southwestern South Carolina, Florida, Georgia, Alabama, Mississippi, Louisiana, and extreme southeastern Texas. The fourth species is the bolson tortoise (Gopherus flavomarginatus), which is found is a very small area in Chihuahua and Durango, Mexico.

3. What is the habitat of the desert tortoise in the southwestern U.S.?

Tortoises occupy a wide variety of habitats in the United States. We can make two generalizations about the habitats, however. Tortoises living north and west of the Colorado River-Grand Canyon complex (California, southern Nevada, southwestern Utah, and extreme northern Arizona) occur in valleys, flat areas, fans, bajadas and washes. These tortoises live in the Mojave and Colorado deserts and are generally found below 4,000 ft in tree yucca (Joshua tree and Mohave yucca) communities, creosote bush and saltbush scrub habitats, and in some ocotillo-creosote habitats. They occupy a wide variety of soil types, ranging from sand dunes to rocky hillsides, and from caliche caves in washes to sandy soils and desert pavements. The tortoise must have suitable soils and terrain for constructing a burrow and must have adequate annual and perennial plants in the spring and/or summer for forage.

Tortoises living in the Sonoran Desert of Arizona occupy entirely different habitats. They are found on the steep, rocky slopes of hillsides. The slopes may be covered with granitic or volcanic boulders and are often covered with dense vegetation. The palo verde-saguaro cactus is the most frequently occupied habitat, although some tortoises are found in oak woodlands and stands of heavy bunch grass.

4. When can one see tortoises in the California deserts? When are they active?

In general, tortoises hibernate from October through February and are underground in burrows during that time. On a warm sunny day, an occasional animal may be found near the mouth of a burrow in late fall or winter.

The prime activity period in the western Mojave Desert is the late winter and spring, from March through May. After this time, when daytime air and soil temperatures are elevated and over 90°F and the food supplies of annual plants have dried, a large percentage of tortoises become inactive and remain underground in burrows. Some will emerge a few times a week or once every two or three weeks, especially in early morning or late afternoon. Others will not come out of burrows until August or September, or when summer thundershowers trigger a brief flurry of above-ground activity. With summer rains, the tortoises will emerge from burrows to drink and travel.

Thus, if one wants to find tortoises in the western Mojave, one should look in prime habitats in spring. In early spring, tortoises are out from mid-morning to mid-afternoon, during the warm part of the day. As air temperatures rise, tortoises emerge from burrows earlier and retreat earlier. By May, tortoises may be out by 6:00 a.m. and back in burrows by 9:00 a.m. In late spring, tortoises may also be active in late afternoon. In summer, the best time to see them is during or after a thunderstorm.

In the eastern Mojave and Colorado deserts, tortoises may also have a summer activity period, which is associated with summer rains and a summer food supply.

5. What is hibernation and what do tortoises do when they hibernate?

Hibernation for a tortoise is a period of inactivity, generally below ground in a burrow or den. The body temperature is lowered and is close to that of the air temperature in the burrow, about 40 to 60°F. The heart rate, respiration rate and all bodily processes are slowed.

6. What do tortoises eat in the wild?

Tortoises are selective in choice of foods. Food preferences depend on locality and availability of the food items. In general,

tortoises in California feed on annual wildflowers, such as blazing stars, lupines, loco weeds, lotus, Indian wheat, forget-me-nots, desert dandelions, gilias, phacelias, coreopsis, alkali goldfields and many other species. They also eat annual and perennial grasses and fresh pads and buds of some species of cactus.

After the annual wildflowers have dried in spring, tortoises will eat the dried plants throughout late spring and into summer and fall. Consumption of dried plant material is somewhat dependent on the tortoise's state of hydration, and whether the tortoise has recently drunk water.

7. Do tortoises drink water in the wild?

Yes. Tortoises drink free water where it collects in pools near rocks or in depressions. Tortoises will dig depressions to collect the water and such depressions can often be seen on areas of desert pavement.

Tortoises can store water in the bladder, where it can be reabsorbed. During spring, summer, and fall rains, tortoises will drink and "freshen" the water stored in the bladder. Bladder water varies in color from clear and colorless to dark brown. Fresh water is clear and colorless; water that has been stored for some time is dark and concentrated.

8. When do females lay eggs and where?

In the wild, females usually lay one or more clutches of 1 to 14 eggs between mid-April and the first week of July. The size of the clutch depends on the size of the female, with small females producing smaller clutches than the larger females.

Females dig the nests with the hind legs and drop the eggs into the nest, placing them with the hind legs and covering them carefully. The location of an undisturbed nest cannot be detected by humans.

Nests are most often associated with the female's burrows. The nest may be in the burrow mound, the mouth of the burrow, or deep inside the tunnel.

9. How much time is required for eggs to hatch?

The eggs, which are the shape and size of ping pong balls, may hatch in 70 to 120 days. The timing is dependent on the location of the nest and how much warmth it receives, among other factors. Some clutches may overwinter and hatch in spring.

10. How large is the largest known desert tortoise? How are tortoises measured?

The largest known desert tortoise is a captive tortoise about 15 inches in length and is the property of the California Department

of Fish and Game. It has been a pet for many years and was turned in to the Fish and Game office in Long Beach in the 1970's.

The largest known wild desert tortoise on the Desert Tortoise Natural Area was about 14.5 inches. The tortoise was a male and was frequently observed on the western portion of the Natural Area in the 1970's.

Tortoises are measured with calipers. One end of the caliper is placed at the edge of the carapace (upper shell) immediately above the head and the other end is placed on the carapace edge above the tail. The straight line distance is considered the length of the shell or carapace.

11. What are tortoise burrows like?

Tortoise burrows vary considerably in length and type. The style of burrow appears to be dependent upon the region, soil type, and vegetation in which they are found. For example burrows in Utah are of two basic types: deep winter dens in caliche caves in washes, some of which are 30 ft in length; and shallower summer burrows three to six feet in length in the flat areas. In the western Mojave Desert, tortoises have a variety of burrows. They use burrows about 2.5 to 10 ft in length for summer estivation and winter hibernation. They may use shallower burrows or pallets that just barely cover the shell in spring, summer, and fall also. These temporary burrows or pallets can be fragile and may be used for shelter for a few days while a tortoise is foraging in a particular area. A temporary burrow usually lasts from a few weeks to a season and then disintegrates.

Each tortoise usually has more than one burrow. The number of burrows the tortoise uses may depend on age and sex, as well as on the season. The burrow is usually the size and shape of the tortoise--half moon in shape and flat on the bottom. Small tortoises have small burrows and large tortoises have large burrows.

12. Why are tortoise burrows important?

The tortoise burrow provides protection from the extremes of heat, cold, lack of moisture, and too much moisture. The burrow is especially important because it provides (a) a cool place for the tortoise during the dry hot days in late spring and summer when water and food are unavailable and (b) a relatively "warm" site for winter hibernation. The tortoise spends most of its life in the burrow.

Burrows serve as protection from predators, such as Common Ravens, coyotes, kit foxes, Gold Eagles, and Greater Roadrunners.

13. Do tortoises migrate?

Migration refers to movement to a particular place for a particular purpose, such as feeding or breeding, and then return to the former site.

I do not think that migration is an appropriate term to use for tortoise movements. Each tortoise has a home range or activity area. A home range is the area in which a tortoise travels, feeds, sleeps, courts, and has its burrows. This is the area with which the tortoise is familiar. Large tortoises have large home ranges and small tortoises have small home ranges. Females are more sedentary than males and do not move about as much, so they probably have smaller home ranges. Large males are known to occupy home ranges over 0.75 square mile.

Tortoises appear to have a good sense of compass direction. They also are very familiar with local landmarks. They can travel to find burrows in a straight line. They also know locations of other tortoises (e.g., males know the location of females), drinking sites, mineral licks, and particular food sources.

Some people, upon seeing tortoises cross roads in spring, think that tortoises are "migrating." Actually the tortoises are merely living in close proximity to the highways and roads and will travel across them during the course of moving about the home range.

14. When do tortoises court and mate?

Male tortoises generally court female tortoises whenever the opportunity presents itself, e.g., in spring, summer, or fall. There does not appear to be a well defined "mating season."

Male tortoises may court and mount the females, but not actually copulate. Don't assume that mating is occurring because you see a male mounted on a female. The subject is complex and deserves much more study.

15. How does one distinguish a male from a female tortoise?

Sex is difficult to determine until the tortoise is about 7 inches in carapace length. Male tortoises develop chin glands or knobs on the chin, a longer gular horn, have a longer tail, and have a concave plastron (a dish-shaped depression on the posterior, underside of the shell).

Females may have longer toenails for digging nests, a small gular horn, and no obvious chin glands.

16. What predators eat tortoises?

The type of predator varies depending on the age and size of the tortoise. There are egg predators, such as the gila monster, kit

fox, coyote, and badger. Predators of juveniles include ravens, roadrunners, some snakes, kit foxes, bobcats, badgers, coyotes, and probably the spotted skunk.

The larger the tortoise, the more likely it will be able to resist predation. Large tortoises may be eaten by kit foxes, badgers, bobcats, coyotes, and golden eagles. The large mammalian predators are not likely to eat tortoises unless other food sources, such as rabbits and rodents, are in short supply. Coyotes and kit foxes may dig tortoises out of their burrows to eat. These predators can eat the tortoise without breaking open the shell.

INFORMATION SOURCES ON DESERT TORTOISES

Professional Organizations

Desert Tortoise Council

Mailing Address: Evelyn St. Amant (Secretary), 5319 Cerritos Avenue, Long Beach, CA 90805

Dedicated to conserving and managing representative desert tortoise populations throughout the geographic range. Annual meetings and symposia held in March; proceedings of symposia and annotated bibliography for sale; information on research, habitat management, human-related impacts to wild populations; newsletters.

Conservation Organization

Desert Tortoise Preserve Committee, Inc.

Mailing Address: P.O. Box 453, Ridgecrest, California 93555

Dedicated to establishing a Desert Tortoise Natural Area in the western Rand Mountains and Fremont Valley; fund raising for land acquisition and protection of habitat; guided tours, slide programs, speakers, educational programs and brochures; stewardship program; newsletter (Tortoise Tracks).

Conservation and Husbandry

California Turtle and Tortoise Club

Mailing Address: see Section I, pages 6 and 7.

Dedicated to conservation and management of captive and wild turtles and tortoises. A focus on the husbandary and care of captive tortoises; agents for an official California Department of Fish and Game adoption program for captive tortoises. Newsletter (Tortuga Gazette) and care sheets.

TORT-Group

Mailing Address: phone number only - 702-739-7113

A Nevada-based group dedicated to the protection of the free-living desert tortoise and its natural habitat and responsible care of captive tortoises. Newsletter and numerous care and husbandary informational brochures and fliers.

BLM Library
Denver Federal Center
Bldg 50, OC-5
P.O. Box 2504
Denver, CO 80

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THE DESERT TORTOISE COUNCIL

5319 Cerritos Avenue
Long Beach, California 90805
Phone (213) 422-6172

GOAL

To assure the continued survival of viable populations of the desert tortoise, *Gopherus agassizi*, throughout its existing range.

OBJECTIVES

1. To serve in a professional advisory manner, where appropriate, on matters involving management, conservation and protection of desert tortoises.
2. To support such measures as shall work to insure the continued survival of desert tortoises and the maintenance of their habitat in a natural state.
3. To stimulate and encourage studies on the status and on all phases of life history, biology, physiology, management and protection of desert tortoise populations.
4. To provide a clearinghouse of information among all agencies, organizations and individuals engaged in work on desert tortoises.
5. To disseminate current information by publishing proceedings of meetings and other papers as deemed useful.
6. To maintain an active public information and conservation education program.
7. To commend outstanding action and dedication by individuals and organizations fostering the objectives of the Council.

BRIEF HISTORY

In 1974, members of the Prohibited and Protected Fishes, Amphibians and Reptiles Committee of the Colorado River Wildlife Council created an interim Four States' Recovery Team to lend a helping hand to the desert tortoise, *Gopherus agassizi*. Interest and concern for the tortoise soon outgrew the scope of the Team; subsequently, on April 21, 1975, its members formally organized the Desert Tortoise Council.

The Council continues to advance toward its goal of assuring the maintenance of viable populations of the desert tortoise throughout its range in California, Arizona, Nevada and Utah. To this end, the Council has effectively combined efforts of state and federal agencies, academic institutions, museums, zoos, turtle and tortoise clubs and concerned citizens.

The Council publishes proceedings of each of its symposia. The reports and scientific papers contained therein are a testimonial to the Council's success in carrying out its intended functions, as well as a reminder that much remains to be done.

APPLICATION FOR MEMBERSHIP

DATE: ____________________

NAME: ____________________ *Please Print* PHONE: ____________________ *Area Code*

ADDRESS: ____________________ *Number* *Street*

____________________ *City* *State* *Zip Code*

( ) Regular ($8.00 per year)

( ) Student ($5.00 per year)

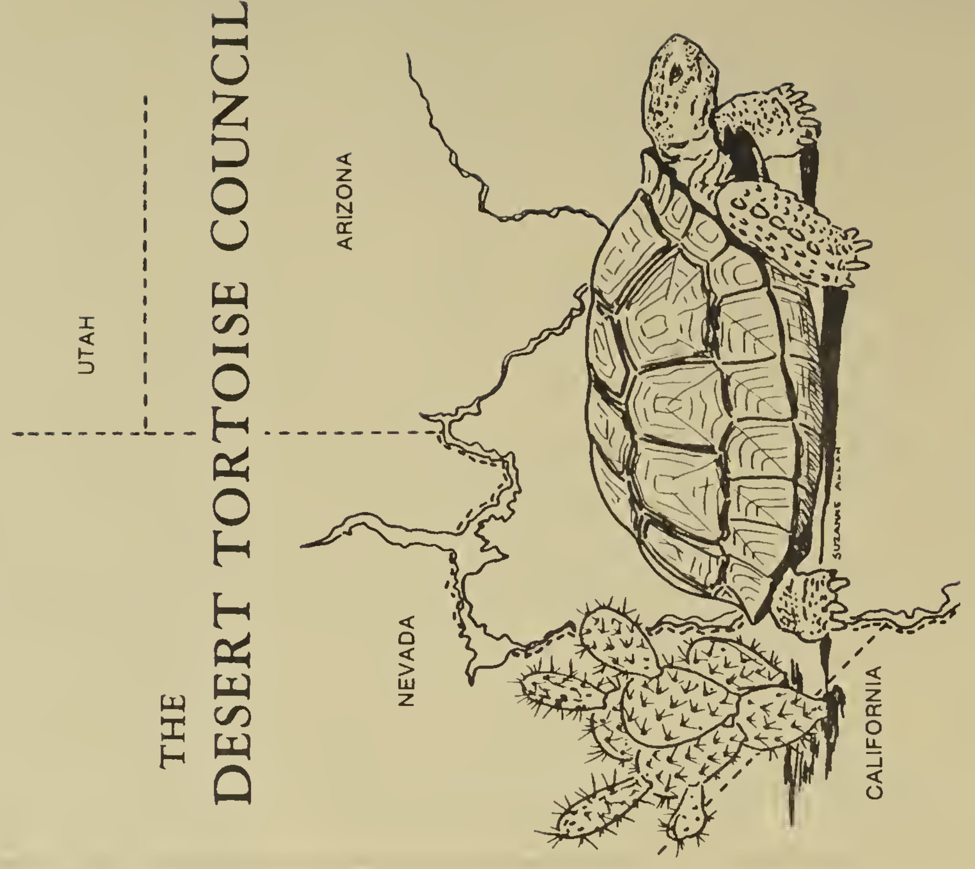
( ) Contributing ($20.00 per year)

( ) Organization ($25.00 per year)

( ) Lifetime ($150 or more)
Lifetime memberships may be paid in installments of $25 per year for six consecutive years.

Make check or money order payable to the DESERT TORTOISE COUNCIL and send with the application to: Desert Tortoise Council, 5319 Cerritos Avenue, Long Beach, California 90805

THE
DESERT TORTOISE COUNCIL



Wild populations of the desert tortoise, native to Arizona, California, Nevada and Utah, continue to decline due to habitat loss and modification, and to illegal collecting. The Beaver Dam Slope population in Utah has been listed as Threatened and the U.S. Fish and Wildlife Service has determined that listing is warranted for the species in the other three states. Only through the efforts of concerned citizens will the tortoises be saved.

Join us in helping the desert tortoise.

For more information contact:

Desert Tortoise Council
5319 Cerritos Avenue
Long Beach, CA 90805
Telephone: (213) 422-6172

PUBLICATIONS AND MATERIAL AVAILABLE

	Cost			
	Members	Non-Members	No. of Copies	Total Cost
Proceedings of 1976 Symposium	$10.00	$11.00		
Proceedings of 1977 Symposium	$10.00	$11.00		
Proceedings of 1979 Symposium	$10.00	$11.00		
Proceedings of 1980 Symposium	$10.00	$11.00		
Proceedings of 1981 Symposium	$10.00	$11.00		
Proceedings of 1982 Symposium	$10.00	$11.00		
Proceedings of 1983 Symposium	$10.00	$11.00		
Proceedings of 1984 Symposium	$10.00	$11.00		
An Annotated Bibliography of the Desert Tortoise, *Gopherus agassizi*	$10.00	$11.00		
Desert Tortoise Pin (gold-color metal pin)	$ 2.75	$ 2.75		
Desert Tortoise Council Logo Pin (round white pin with gold tortoise and lettering	$ 2.75	$ 2.75		
POSTAGE				
TOTAL COST				

Please add $1.00 PER VOLUME for postage and handling.

Please add 25¢ PER PIN for postage and handling.

Countries other than U.S., Canada or Mexico ADD $2.00 additional per volume if you want them shipped air mail.

Make check or money order payable to the DESERT TORTOISE COUNCIL and mail to: 5319 Cerritos Avenue, Long Beach, California 90805.

NAME ______________________ ADDRESS ______________________

TORTOISE TRACKS

THE DESERT TORTOISE PRESERVE COMMITTEE NEWSLETTER
P.O. Box 453, Ridgecrest, CA 93555

SPRING, 1989
Volume 10, No. 1

MAJOR GIFT LAUNCHES TORTOISE DISCOVERY CENTER

Drawing by Pat Brame

Artist's conception of Tortoise Discovery Center
when based at the Desert Tortoise Natural Area.

LIFELINE FUND REPORT

A gift of $25,000 is being made to the Desert Tortoise Preserve Committee's Lifeline Fund for the establishment of the Committee's Tortoise Discovery Center facility. This very important and generous contribution by a recent member of the Committee will make possible the purchase and adaptation of a motor home for use as a visitor center at the Desert Tortoise Natural Area, and as a mobile conservation education program.

The Discovery Center will be staffed by the newly hired Committee naturalist (see accompanying article), and will add greatly to his effectiveness — both in providing interpretive services to Natural Area visitors, and protection of the preserve. The Center will also enhance other aspects of the Committee's work by building public support for our conservation goals, membership in the Committee, and serving as a hub for volunteer activities.

Lifeline Fund Report, cont.

If you have current knowledge or expertise regarding motor homes, are aware of a good purchase opportunity, or could suggest sources for donated equipment or services such as mechanical inspection, we would appreciate your input. Just give me a call at (818) 797-0739 or write to me at P.O. Box 70606, Pasadena, CA 91107, as soon as possible.

We are now searching for a suitable used, late model (about 1985) Class A motor home, tan color, approximately 27' or more in length, with maximum self-sufficiency and storage space, and a floor plan providing easy separation of public and private quarters. Interior, exterior, and mechanical condition are also important, of course.

Present funding is sufficient for start-up and short-term operation of this innovative and versatile facility, but to take full advantage of its potential, the Lifeline Fund is working to establish funding for continuing operational expenses including staff, maintenance, fuel, insurance, and educational materials, to allow year-round operation. With support from corporate, foundation, government, and individual donors, the Tortoise Discovery Center will become a leading resource for desert conservation in California. Your contributions have already helped make that possible.

Curtis Horton, Director
The Desert Tortoise Preserve
Committee's Lifeline Fund

JEFF HOWLAND SELECTED AS NATURALIST FOR 1989

The Desert Tortoise Preserve Committee is delighted to announce the selection of Jeff Howland as the Naturalist for the Desert Tortoise Natural Area during spring of 1989. Jeff will begin a four-month contract to provide visitor services on March 12. He will be present at the Interpretive Center on all weekends, as well as three days during the week, and will welcome visitors, lead scheduled and unscheduled tours, sell T-shirts and other products, and assist with wildlife protection.

Jeff has an impressive background in teaching and research on reptiles, amphibians, and deserts. He has a B.S. in Biology from the University of Illinois, an M.S. in Zoology from the University of Georgia, and is currently a Ph.D. candidate at U.C.L.A., where he is completing a dissertation on the natural history, ecology, and physiology of the desert iguana. During the course of his studies, he also worked with several other amphibians and reptiles, including the red-eared turtle, green anole, greater earless lizard, tree lizard, and Merriam's spiny lizard.

Jeff has led field trips through desert habitats, given programs to visitors at Big Bend National Park, and has teaching experience in the subjects of ecology, vertebrate natural history and morphology, herpetology, mammalogy, evolution, and behavior. Recently his interests in conservation have focused on developing a preserve in the Colorado Desert near Desert Center and the lower Amazon basin. Join Jeff some weekend at the Natural Area for a new experience!

Special thanks are due to 117 of our members and donors who contributed to the special fundraiser for the Naturalist. Over $4800 have been donated, with several individuals making substantial contributions: K. H. Berry, Marv Cornett, Paul Donaldson, Linda Duchein, Tom Dodson, Charlotte Gould, Ron and Mary Ann Henry, Joy Lane, Mimi Loutrel, Joanne Nissen, Barbara Schworm, Pearl Seidman, and Brett Stearns.

MEMORIAL DONATION

Ruth Boucher, a Sacramento, California, member of the Desert Tortoise Preserve Committee, recently passed away. A very dear friend of hers, Catherine Smith of Maryland, sent Ruth's husband, Forrest, a check in the amount of $500.00 to be donated to Ruth's favorite charity. Mr. Boucher tells us that "Ruth loved her tortoises," and that he has no doubt that "she would want it to go toward bettering the tortoise preserve."

The donation, made to the Naturalist fund raising drive and received in early December, gave the effort a tremendous start ... a wonderful tribute to a friend of the tortoise.

NEW TOUR GUIDES WELCOMED

Katherine Bueler, Gladys Elder, Tammara Gracey, Doll Hanson, Robert Lafond, Mary Shepherd, Clarence Smith, and Martin Spann have responded to the appeal for tour guides. Betty Forgey, Tour Coordinator, anticipates thousands of visitors to the Natural Area this spring, and is looking forward to working with them and welcoming back the "seasoned guides".

GENERAL INFORMATION for DESERT TORTOISE NATURAL AREA TOURS

VISITORS ARE WELCOME AT THE NATURAL AREA ANY TIME. AT THE INTERPRETIVE CENTER YOU WILL FIND ILLUSTRATED INFORMATION AND SELF-GUIDING NATURE TRAILS.

Tour Guides will be available to groups of 10 or more, provided the Committee is notified of a group's desire to tour the Natural Area.

Call Betty Forgey (619) 762-6422 to book a tour...or write P.O. Box 307, Boron, California 93516.

April and May are typically the best months for wildflower appreciation and opportunity to observe tortoises above ground.

Weekday tours are acceptable. Booking for weekend tours should be made as soon as possible - there are limitations on the number of tours available on the weekends.

April 22nd and May 6th are this year's "Open Tour" dates. The Committee will attempt to accommodate as many small groups and individuals as possible on these date — but bookings must be made with Betty Forgey ahead of time.

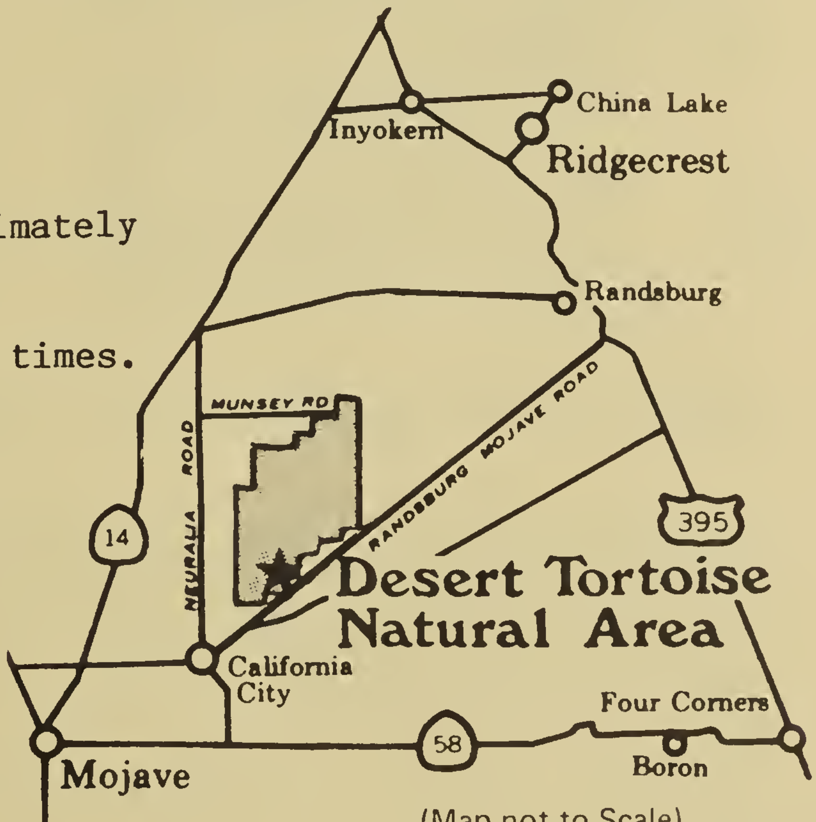
Tour participants should assemble at the parking lot no later than 8:45 a.m. Most tours last approximately two hours. (By late May tours should start by 8 a.m. if the days are especially hot. You will be advised.)

Participants MUST:

Wear sturdy shoes - no open toes, no thongs.
Be able to walk over sandy terrain for approximately two miles.
Not bring dogs onto the Natural Area.
Keep small children under surveillance at all times.

Participants MAY:

Carry drinking water.
Wear a sunhat and use suntan lotion.
Carry a camera and/or binoculars.
Expect to need a sweater or windbreaker early in the day.
Wear long pants.
Be prepared for extremes in weather such as wind, heat and/or cold.

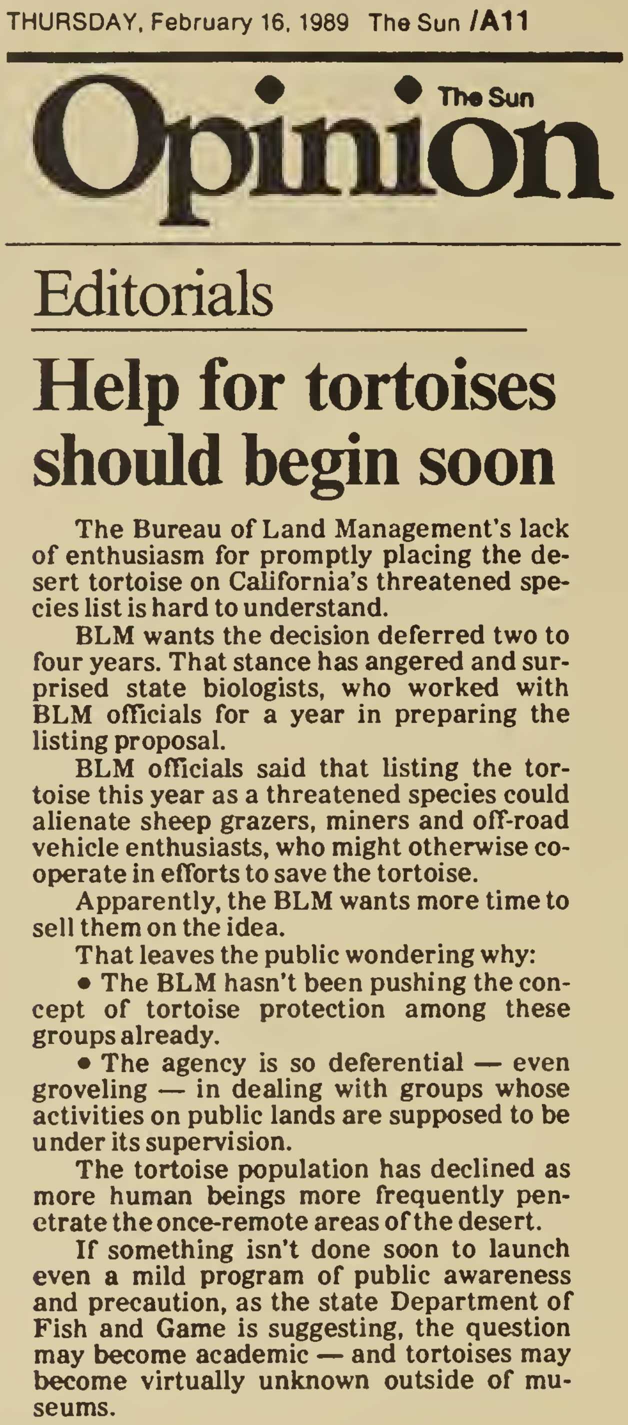


(Map not to Scale)

You may encounter other reptiles such as the Mojave green rattlesnake. Tour guides will advise precautions.

DIRECTIONS: Approximately one mile after you pass the Lakeshore Inn on the Mojave-Randsburg Road, you will leave the paved road and drive to the left onto a dirt road. Proceed approximately five more miles until you see the Desert Tortoise Natural Area sign - turn left to the entrance of the Natural Area and continue on to the Interpretive Center and parking area.

Betty Forgey,
Tour Coordinator



THURSDAY, February 16, 1989 The Sun /A11

Opinion

The Sun

Editorials

Help for tortoises should begin soon

The Bureau of Land Management's lack of enthusiasm for promptly placing the desert tortoise on California's threatened species list is hard to understand.

BLM wants the decision deferred two to four years. That stance has angered and surprised state biologists, who worked with BLM officials for a year in preparing the listing proposal.

BLM officials said that listing the tortoise this year as a threatened species could alienate sheep grazers, miners and off-road vehicle enthusiasts, who might otherwise cooperate in efforts to save the tortoise.

Apparently, the BLM wants more time to sell them on the idea.

That leaves the public wondering why:

- The BLM hasn't been pushing the concept of tortoise protection among these groups already.
- The agency is so deferential — even groveling — in dealing with groups whose activities on public lands are supposed to be under its supervision.

The tortoise population has declined as more human beings more frequently penetrate the once-remote areas of the desert.

If something isn't done soon to launch even a mild program of public awareness and precaution, as the state Department of Fish and Game is suggesting, the question may become academic — and tortoises may become virtually unknown outside of museums.

COMMISSION POSTPONES LISTING of TORTOISE

At their February 3rd meeting in Long Beach, the California Fish and Game Commission postponed making a decision on whether to declare the desert tortoise a threatened species. A last-minute deluge of letters from opponents of the listing -- including one from the State Director of the Bureau of Land Management (see following Editorial) -- was the reason given for waiting until June to determine the future of California's state reptile.

Members of the Desert Tortoise Preserve Committee, the Desert Tortoise Council, and representatives of several other organizations attended the meeting on behalf of the tortoise. They gave eloquent and factual testimony, encouraging the Commission to accept the recommendation of the California Department of Fish and Game, which was based on biological data, that the tortoise be listed as threatened. Don Moore, of the Kerncrest Audubon Society, offered the following thought:

> "If we yield to the politics of procrastination in the vain hope that things can be improved by better plans, more meetings, and deeper studies, today may mark an important turning point: the point of no return."

EDITORIAL

BUREAU OF LAND MANAGEMENT TURNS AWAY FROM PROTECTING THE TORTOISE

The desert tortoise received a severe blow on February 3, not only from the Fish and Game Commission but also from Bureau of Land Management's State Director, Ed Hastey. After giving the impression that the Bureau of Land Management planned to remain neutral on the State listing, Ed Hastey delivered a last-minute letter to the Commission, not only opposing the listing but requesting a delay of two to four years!

In his letter, Mr. Hastey essentially asked them to delay the listing for political reasons -- until new BLM programs to enhance desert tortoises and their habitat could be evaluated. He also did not want to dampen the support he is supposedly getting from user groups. When questioned by reporters from the Los Angeles Times, Hastey said that he feared that the State listing could be perceived as overly restrictive by sheep grazers and off-road vehicle enthusiasts who work and play in the vast deserts of California. What about the biological evidence? The sky has fallen in on the tortoise -- belittling the facts will only place this beleaguered reptile in further jeopardy.

The Board of Trustees is upset and extremely disappointed with Mr. Hastey. In the last few years, the Board has enjoyed improved relations with the Bureau, particularly with former Ridgecrest Area Manager Patty McLean. Mr. Hastey's position signals a "business as usual" approach, a rejection of on-the-ground changes to protect the tortoise outside of two very limited areas, the Desert Tortoise Natural Area and the Chuckwalla Bench Area of Critical Environmental Concern.

Whatever Mr. Hastey's purpose, he has made his intentions toward the tortoise very clear: DELAY. FAVOR THE USERS. PREPARE MORE PLANS. TALK. HOLD MEETINGS. DON'T MAKE WAVES. SACRIFICE THE BIOLOGICAL RESOURCES.

In the last issue of Tortoise Tracks, we reported that the Bureau of Land Management has two new plans -- one for the entire geographic range of the tortoise in the southwestern United States, and one for California specifically. We want our readers to understand that these documents are *just plans*, nothing else. We need changes on the ground to reduce high mortality rates. We must have:

- Reductions in off-road vehicle use in prime habitats;
- Severe cuts in the extent and intensity of sheep grazing, which is rapidly deteriorating the habitat;
- Reduction in losses and fragmentation from energy, mineral, agricultural and urban projects.

The Bureau of Land Management is arrogant to believe that they can produce plans and undertake changes alone, especially when large portions of tortoise habitat are on a mixture of private, state, and federal lands. The State of California can also play a major role through the California Endangered Species Act and the California Environmental Policy Act. Without State listing, the Department of Fish and Game is severely hampered in its abilities to protect the tortoise and to negotiate mitigation and compensation measures with developers, especially on energy and State highway projects. For example, in recent mitigation and compensation packages for solar power development at Kramer, the State-listed Mohave ground squirrel played the pivotal role, not the tortoise. Furthermore, sources of State wildlife funds are not available to unlisted species.

We call upon the Bureau to change its position, to withdraw the letter of February 1, and to begin working together to implement major changes in land use. Mr. Hastey should not forget his charge from Congress under the Federal Land Planning and Management Act of 1976. The Bureau is supposed to provide for multiple use *as well as sustained yield.* So far, all we have seen in the California deserts is a severe downward trend in tortoise populations, loss of habitat, and deterioration in vast areas. This is not sustained yield. Why wait for more plans? The 1980 *California Desert Conservation Area Plan* was a disaster for the tortoise. The 1979 plan for the Desert Tortoise Natural Area was not successful in stemming declines. WE NEED A CHANGE and WE NEED IT NOW.

The Board of Trustees
Desert Tortoise Preserve Committee, Inc.

If our readers wish to contact Mr. Hastey, his address is:

Mr. Ed Hastey, State Director
Bureau of Land Management
2800 Cottage Way Room E-2841
Sacramento, CA 95825

Please send copies of your letter to Senators Alan Cranston and Pete Wilson. Their addresses are:

Senator Alan Cranston
112 Hart Senate Office Building
Washington, D.C. 20510-0501

Senator Pete Wilson
720 Hart Senate Office Building
Washington, D.C. 20510-0502

OFF-HIGHWAY VEHICLE USERS CLAIM VICTORY IN LISTING DELAY

A February 22nd article in *Cycle News* gives credit to "devoted" off-road vehicle users for delaying the State-listing of the desert tortoise as threatened.

Mike Bishop, author of the article, quotes several off-road vehicle (ORV) users, many of whom spoke at the Commission meeting. If the quotes in the article are accurate, most speakers representing ORV users presented Fish and Game Commissioners with erroneous information. For example:

- Pat Davison, representing the California Association of Four-Wheel Drives, claimed that State listing is not the only way to get needed funding. Proposition 70 and the Federal Land and Conservation Fund both have needed money available.

  FACT: *Listed* species have highest priority for receiving funds. Candidate species for listing are second in line, and unlisted or rejected species are last. The tortoise has received some limited funds so far because it is a candidate for listing, but the dollar amounts have been very limited. If the tortoise is rejected for State listing or the State listing is delayed, the tortoise is unlikely to receive badly needed monies from Proposition 70, the Wildlife Tax Check-off Fund, or the Environmental License Plate Fund.

- Ron Fite, from the California Desert Coalition, warned the Fish and Game Commission that State listing would kill the

El Mirage Recreation Area Project, an intensive off-road vehicle use area.

> **FACT:** El Mirage is no longer prime tortoise habitat and is not being sought by tortoise biologists in any agency or conservation group for the tortoise. El Mirage has not ever been sought for the tortoise.

- Ed Waldheim, an Off-Highway Vehicle (OHV) Commissioner and American Motorcycle Association Representative, said that OHV funds promote tortoise conservation and that "millions of dollars have been put into access guides, signs, fencing, and ranger salaries."

> **FACT:** The OHV Commission has yet to give a single dollar to help conserve tortoise populations and their habitat.

- Ed Waldheim also claimed that "with simple listing of the tortoise, 23 million acres of desert land would be severely restricted to OHV use."

> **FACT:** There are about 2.5 million acres of remaining tortoise habitat in the California desert, about half of which is severely damaged. As of this time, only 23,000 acres (or less than 1/10 of one percent) are closed to recreation vehicles. The only closed area is the Desert Tortoise Natural Area.

As you can see, the off-road representatives presented bizarre, erroneous, and often inflammatory statements to the Fish and Game Commissioners in an effort to stop the State listing. They do themselves and their memberships a disservice with this disinformation.

AMERICAN HONDA TO BUILD VEHICLE TEST FACILITY ADJACENT TO NATURAL AREA

American Honda will begin construction of a vehicle test facility on a six-square mile parcel of land at the northwest corner of the Desert Tortoise Natural Area this spring. American Honda's recent acquisition at Cantil includes five square miles of old agricultural fields and one square mile of tortoise habitat.

L. Bruce Nybo, Inc., a Bakersfield engineering firm acting on behalf of American Honda, first proposed development of the land at Cantil in summer of 1987 to Kern County. The Kern County Planning Department solicited opinions on the proposal, and the Desert Tortoise Preserve Committee, Bureau of Land Management (Ridgecrest Area Ofice), and Fish and Wildlife Service responded with extensive comments, expressing concern about impacts to tortoises on the one-square mile parcel of remaining tortoise habitat, as well as to the adjacent Desert Tortoise Natural Area. Potential impacts include loss of tortoises, loss of habitat, growth in the region from development of light industrial facilities, increased noise, and reduction in quality of the wild nature of the Natural Area. In February of 1988, Kern County issued a permit with 49 conditions, stating that there would be no significant environmental impacts.

Several conditions on the County permit are mitigation/compensation measures for the tortoise. They include:

- One or more of the following mitigation/compensation measures:

  Note: The County has no required date for completion of this measure.

  (1) Dedication of two adjacent sections (Sections 5 and 7) on the northwestern edge of the Natural Area, with fencing of outside boundaries and rehabilitati of damaged areas, OR

  (2) Dedication and restoration of acreage similar to Sections 5 and 7 adjacent to or within the Desert Tortoise Natural Area, OR

  (3) A cash contribution in an amount not to exceed $300,000 to the Nature Conservancy for land acquisition or to the Desert Tortoise Preserve Committee for projects, activities, and expenses that will enhance the continued preservation and existence of the tortoise;

- Construction of a tortoise-proof fence along the southern and eastern parts of the project area, adjacent to the Natural Area;
- Removal of the tortoises on the square mile of habitat within the project area and relocation to another site;
- An education program for employees;
- Measures to discourage raven use of the area, including control of garbage;
- Measures (earthen berms, walls) to prevent noise levels of 45 db or greater

into the Natural Area or adjacent tortoise habitat.

Construction did not begin immediately because American Honda had to acquire the property. The sale was finalized in late 1988. Before American Honda can break ground on the tortoise habitat this spring, they first must secure a Memorandum of Understanding from the California Department of Fish and Game. We understand that Honda and its representatives have contracted with Peter Woodman and Dr. Tom Mulroy for assistance on tortoise surveys and relocation efforts.

We will be closely following the progress on this very sensitive project and will give you a status report in the Summer issue.

BOARD OF TRUSTEES WELCOMES NEW MEMBER

Tom Dodson, newly elected Second Vice-President of the Desert Tortoise Preserve Committee, has had almost 20 years of experience in land use planning, environmental and resource management, and regulatory compliance management. Since 1983 he has been president of Tom Dodson and Associates, an environmental consulting firm located in San Bernardino, California.

Mr. Dodson grew up in San Bernardino, graduated from Pacific High School, and has a Masters Degree in Geography from the University of California, Berkeley. He has served as visiting lecturer in environmental planning at California State University, San Luis Obispo, and as an environmental consultant to private industry and Sonoma County. He was Supervising Environmental Specialist for the County of San Bernardino for almost two years, where he assisted in the streamlining of local environmental guidelines. This effort subsequently won a national award.

From 1976 to 1985 Mr. Dodson served as the civilian Environmental Protection Officer for the Naval Weapons Center at China Lake, California. This involved the management of the total environmental program for a 1.1 million acre naval research laboratory and test facility located in the Upper Mojave Desert. Under his administration, the Center's hazardous waste management program was developed and the operation plan prepared. This methodology was then adopted for all Navy facilities on the West Coast. During his tenure a burro removal program was initiated and over 7,000 of these exotic animals were removed and habitat restoration programs begun.

As president of Tom Dodson and Associates, Mr. Dodson assumes responsibility for a broad range of activities including preparation of environmental documents, regulatory permitting and land use planning assistance, site-specific resource evaluations, development of waste management programs, and working with local public and governmental agencies in developing and implementing solutions to complex problems. He makes frequent presentations to decision-makers and provides expert testimony at administrative and judicial hearings. He also negotiates compensatory mitigation packages with regulatory agencies, including the Corps of Engineers, Department of Fish and Game, U.S. Fish and Wildlife Service, and the California Energy Commission.

At present Mr. Dodson is acting as consultant for the South Coast Air Quality Management District in the preparation of an Environmental Impact Report for the regional air quality management plan. He is also involved in a number of waste disposal site selection projects in the Mojave Desert.

Mr. Dodson and his wife, Brynn, live in San Bernardino and actively support various area-wide environmental groups and concerns.

MUSEUM EXHIBIT PLANNED

The desert tortoise is the subject of a museum exhibit being developed for the San Bernardino County Museum. The exhibit, which will consist of two, 5' x 5' panels, is being coordinated by the Inland Empire Chapter of the California Turtle and Tortoise Club, with Dr. Kristin Berry serving as technical advisor. One panel will deal with desert tortoise natural history and paleontology. The other will focus on impacts on the desert tortoise population and its habitat. The second panel will also introduce the concepts of endangered species, fragmentation, and indicator species. Projected completion of the display is Calendar Year 1989.

YOUR MEMBERSHIP IS IMPORTANT

Membership in the Desert Tortoise Preserve Committee is an expression of your concern for the welfare of the tortoise, and it offers you a means of staying informed during these crucial times. Dues, which are on a calender year schedule, help to pay for your newsletter and administrative costs of running the organization. If you have not already done so, please take a moment and renew.

WE APPRECIATE YOU...and your membership!

FENCE MAINTENANCE PARTY

Please plan to join the team on April 2nd to work at the Desert Tortoise Natural Area. Bring shovels, rakes, and heavy hoes; lunch and lots of water; and meet at the northeast corner of California City Blvd. and Neuralia at 8:00 a.m. (note time change that morning). But most of all, meet and work with others who care about the tortoise. For further information, call Bev Steveson at (805) 832-9121.

The work has already been started by 21 men and women who turned out on March 5th. The work party was a great success, according to Bev. Huge piles of sand and russian thistle were moved away from approximately 1/2 mile of fence. Probably seven miles of fence remain that need attention -- so we need all of the help possible for this and future work parties.

CALENDAR

March 17 thru 20, 1989
DESERT TORTOISE COUNCIL
FOURTEENTH ANNUAL SYMPOSIUM
Mesquite, Nevada

April 2, 1989
FENCE MAINTENANCE PARTY at
DESERT TORTOISE NATURAL AREA
See Information Above

April 22, 1989
"OPEN TOUR" of the NATURAL AREA
Reservations Required
See Page No. 3

April 23, 1989
CALIFORNIA TURTLE and TORTOISE CLUB
ORANGE COUNTY CHAPTER SHOW
Harbor Blvd. at La Palma Ave.
Anaheim, California

May 6, 1989
"OPEN TOUR" of the NATURAL AREA
Reservations Required
See Page No. 3

May 21, 1989
CALIFORNIA TURTLE and TORTOISE CLUB
VALLEY CHAPTER SHOW
14201 Huston Street
Sherman Oaks, California

June 17, 1989
CALIFORNIA TURTLE and TORTOISE CLUB
WESTCHESTER CHAPTER SHOW
For Information, Call (714) 962-0612

DESERT TORTOISE NATURAL AREA and COMMITTEE INFORMATION ... and FUND RAISING PRODUCTS ... ARE AVAILABLE AT CALIFORNIA TURTLE AND TORTOISE CLUB SHOWS.

TORTOISE TRACKS is published quarterly by the Desert Tortoise Preserve Committee, Inc.
Jean Jones, Editor

DESERT TORTOISE PRESERVE COMMITTEE, INC.
P.O. Box 453, Ridgecrest, CA 93555

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BUREAU OF LAND MANAGEMENT
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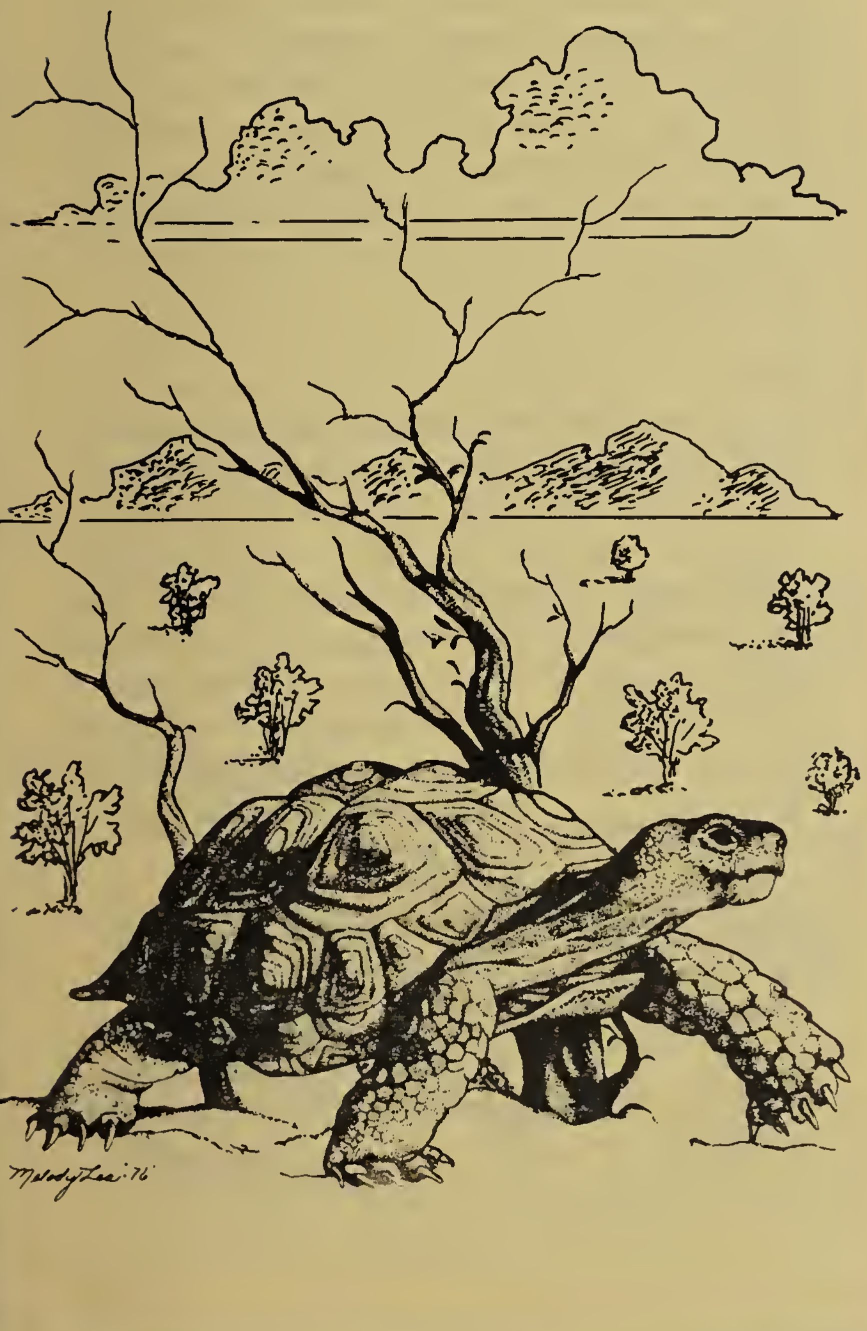
Desert Tortoise Natural Area



LOCATION

The Desert Tortoise Natural Area lies in the northwestern Mojave Desert in Fremont Valley, on the western edge of the Rand Mountains in eastern Kern County. It is just north of California City - a two-hour drive from Los Angeles and one hour and a half from Bakersfield.

WILDLIFE IN THE NATURAL AREA

This 38 square mile area of prime natural habitat has the finest known populations of the desert tortoise, (Gopherus agassizii) which is the official California State Reptile. The Bureau of Land Management, U. S. Department of Interior, has designated the Desert Tortoise Natural Area as an "Area of Critical Environmental Concern."

There are many other animals present, including the rare Mohave ground squirrel, desert kit fox, coyote, badger, jackrabbit and desert woodrat. Some of the reptiles are the collared lizard, leopard lizard, sidewinder, chuckwalla, desert iguana and the western whiptail. Examples of birds to be seen are the cactus wren, LeConte's thrasher, ash-throated flycatcher, redtailed hawk, ladderback woodpecker and roadrunner.

The Committee's primary goal is to raise funds for purchasing private parcels of land within the perimeter. In 1974, 16 square miles of habitat had to be acquired. Since that time, the Desert Tortoise Preserve Committee, Bureau of Land Management, and California Department of Fish and Game have acquired about 6.5 square miles. The Nature Conservancy has negotiated most land purchases. About 9.5 square miles of private parcels remain to be acquired and most of these are small. Acquisition of the private lands will help to protect and conserve the tortoise populations.

The Committee is also active in conservation education. An Interpretive Center was erected by the Bureau of Land Management after extensive work on the design and content by members of the Committee. This structure is located at the entrance to the Natural Area, in the southeast corner, 5 miles from California City Blvd. on the Randsburg Road. The Interpretive Center, with kiosk containing descriptive panels, shelter and benches was dedicated April, 1980. Self-guiding nature trails are available.

The Committee conducts guided tours here for schools, museums and other groups in spring, when the tortoises emerge from hibernation.

Since its inception in 1974, the Desert Tortoise Preserve Committee has been supported in its work by thousands of individuals, several conservation organizations, wildlife groups and scientists.

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Wildlife is best observed in the spring and some species are most abundant during years when there are carpets of wildflowers as a result of a wet winter. There are over 160 different kinds of plants - desert candles, Mohave asters, primroses, blazing stars, coreopsis, lupines, phacelias, thistle sage and gilias, to name a few. Among the flowering shrubs, the creosote bush is conspicuous for its height and abundance, and essential for providing shelter for wildlife.

THE THREATENED TORTOISE

Within the desert's fragile ecosystem tortoise populations are diminishing; in some places they have disappeared. Losses are due to collections for pets (now illegal) and habitat degradation. Habitat has been lost or damaged from mining, livestock grazing, development of desert lands for agriculture and sub-divisions, as well as off-road vehicle use.

Tortoise populations are slow to recover from vandalism and habitat degradation because of their low reproductive potential. Females do not breed until 15 to 20 years old and then may lay clutches of eggs only when adequate forage is available. Also, survival of juveniles is low.

WHAT ABOUT CAPTIVE TORTOISES?

Owners of captive tortoises should not release their pets in the desert. Scientific studies have shown that captives do not readjust well to desert conditions. They are likely to die a lingering death or fall easy prey to predators. For these reasons and because they may introduce diseases, the California Department of Fish and Game and the Bureau of Land Management prohibit release of captives in the open desert or the Natural Area.

Actively engaged in protecting the Desert Tortoise Natural Area is the Bureau of Land Management, trustee of public lands. Its informative brochure may be secured by writing:

Bureau of Land Management
112 East Dolphin
Ridgecrest, California 93555

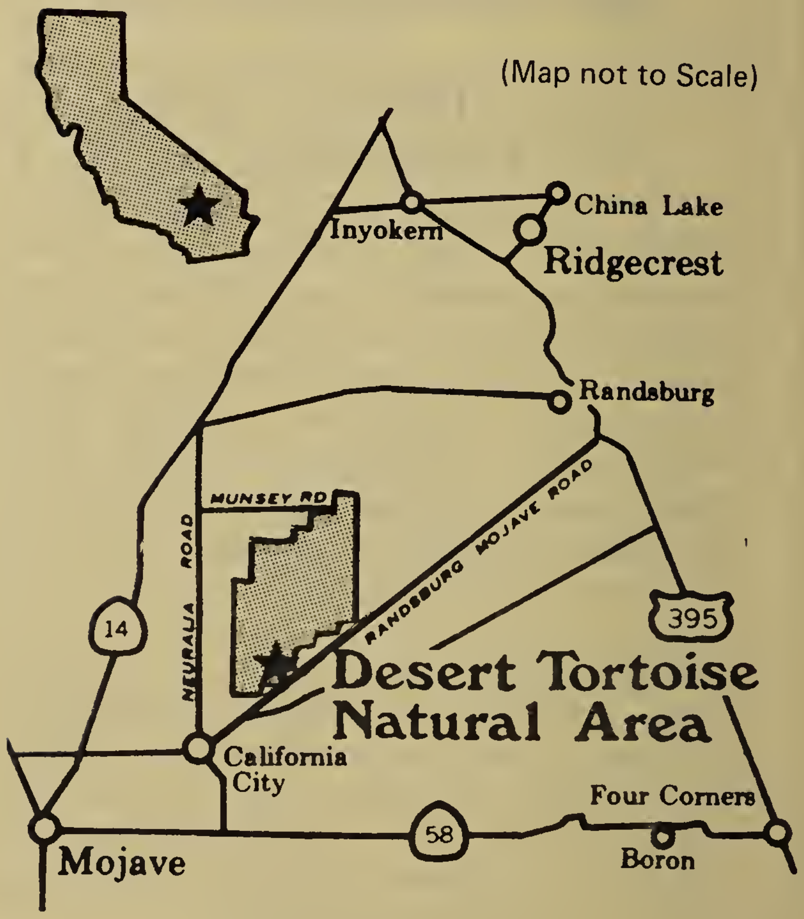
THE DESERT TORTOISE PRESERVE COMMITTEE

The Committee, a non-profit organization, is composed of private citizens who are deeply concerned for the welfare of wild tortoise populations throughout their geographic range. Founded in 1974, the Committee's first goal was to protect the habitat in the Natural Area from unauthorized use by off-road vehicles and livestock with a fence. This goal was achieved in 1977 when the Bureau of Land Management installed a mesh fence around most of the perimeter. The fence does not restrict movement of the tortoises and other wildlife because it is raised 10 to 12 inches off the ground.

The Committee invites you to join its supporters through active or contributing membership; or your organization may desire an associate membership. Applications, as well as the quarterly newsletter "TORTOISE T-R-A-C-K-S" or information concerning tours, programs, or opportunities for scientific research may be obtained by writing to:

Desert Tortoise Preserve
Committee, Inc.
P.O. Box 453
Ridgecrest, California 93555

Funds are raised through tax-deductible donations, illustrated lectures and the sale of merchandise including tortoise-decorated T-shirts, ceramic wind chimes, pendants and bolo ties, stationery and needlecraft kits.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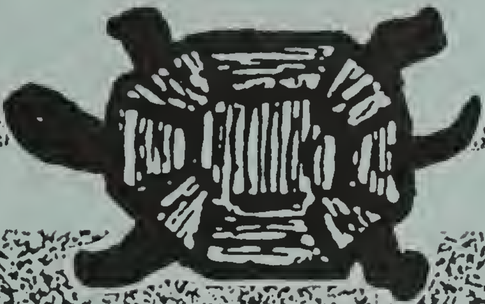

What's Ahead For . . .

Desert Tortoise Natural Area

the DESER NATU

Two hundred million years ago, the desert tortoises' ancestors shared their world with dinosaurs. Today, they are facing a more difficult challenge: living with man. Although desert tortoises appear to be sturdy creatures, they have special needs that require special attention.

In response to these needs, the Bureau of Land Management (BLM) established the Desert Tortoise Natural Area (DTNA) in 1976. This is a special place, a home for more desert tortoises per square mile than found anywhere else. The official California State Reptile, desert tortoises are fully protected under State law, managed as a sensitive species by BLM, and under consideration for listing as a threatened and endangered species by the California Department of Fish and Game and the U.S. Fish and Wildlife Service.

Located in the western Mojave Desert in northeastern Kern County, the DTNA is part of the California Desert Conservation Area. Designated as an Area of Critical Environmental Concern (ACEC) in 1980, the DTNA is managed to protect a unique tortoise habitat in its natural state and to expand public awareness of its outstanding values. Almost 25,000 acres are included in the area, with about 16,200 acres administered by BLM, 475 acres by the California Department of Fish and Game, and 2,000 by supporting conservation organizations.

The Natural Area has been managed by BLM under a 1979 habitat management plan, but will now be administered under the provisions of an Area of Critical Environmental Concern management plan coordinated with the Desert Tortoise Preserve Committee and approved by BLM and the California Department of Fish and Game in February 1988. In addition to describing the area, its resources, and its past management, the plan outlines goals and specific actions for the future management of the DTNA. The following goals and supporting actions will be implemented by the agencies and the Desert Tortoise Preserve Committee, with the assistance of other volunteers and organizations whenever possible.

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

California Desert District
1695 Spruce Street
Riverside, CA 92507

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

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Bureau of Land Management
RIDGECREST RESOURCE AREA OFFICE
112 East Dolphin Street
Ridgecrest, CA 93555

Form 1542-2
(July 1983)

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T TORTOISE
RAL AREA

GOAL

STATEMENT

"To protect, conserve, and enhance desert tortoise populations; allow populations to fluctuate naturally; and reverse population declines."

Desert tortoises are being negatively impacted by many human actions, including collecting, shooting, the release of captive or non-native tortoises, vandalism, general harassment, and road kills. To overcome this, a series of signs prohibiting the collection of desert tortoises, the release of captured or pet desert tortoises and non-native turtles and tortoises (which may introduce disease to local populations), the use of firearms within the Natural Area, and the entry of vehicles on public lands will be installed and maintained at 1/8-mile intervals along the boundaries of the area. The presence of law enforcement and visitor service personnel will be increased to deter harassment of the wildlife and improper use of the area.

In addition, to reduce loss of desert tortoises from vehicle kills around the periphery of the DTNA, off-road events will be eliminated on adjacent public lands from March 1 to June 30 (when tortoises are most active outside of their burrows). The numbers of routes of travel on adjacent public lands also will be reduced.

Ravens are common in the region, and extraordinarily high rates of raven predation on juvenile tortoises have been documented along the DTNA fence boundary. The wooden fence posts used in the protective boundary fence apparently provide perches for the ravens to use as lookout and feeding stations. To reduce raven predation on juvenile tortoises to more natural levels, BLM will be conducting a study to determine if modifying the fence to eliminate the perches would be an effective deterent. In addition, BLM will be seeking a method to eliminate raven perches at the Interpretive Center.

The following is a list of BLM California Desert Offices for your information:

CALIFORNIA DESERT INFORMATION CENTER
831 Barstow Road
Barstow, CA 92311
(619) 256-8617

CALIFORNIA DESERT DISTRICT OFFICE
1695 Spruce Street
Riverside, CA 92507
(714) 351-6394

RIDGECREST RESOURCE AREA OFFICE
112 E. Dolphin Street
Ridgecrest, CA 93555
(619) 375-7125

BARSTOW RESOURCE AREA OFFICE
150 Coolwater Lane
Barstow, CA 92311
(619) 256-3591

NEEDLES RESOURCE AREA OFFICE
101 W. Spikes Road
Needles, CA 92363
(619) 326-3896

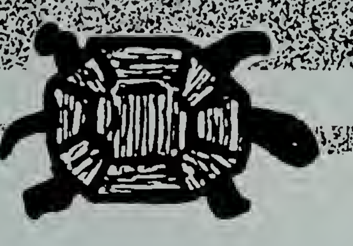
INDIO RESOURCE AREA OFFICE
1900 Tahquitz-McCallum/Suite B-1
Palm Springs, CA 92262
(619) 323-4421

EL CENTRO RESOURCE AREA OFFICE
333 So. Waterman Avenue
El Centro, CA 92243
(619) 352-5842

U.S. Department of the Interior
Bureau of Land Management
California
DESERT DISTRICT

Desert Tortoise Natural Area

What's Ahead for . . .



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CALIFORNIA DESERT CONSERVATION AREA

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Form 1542-2
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U.S. Department of the Interior
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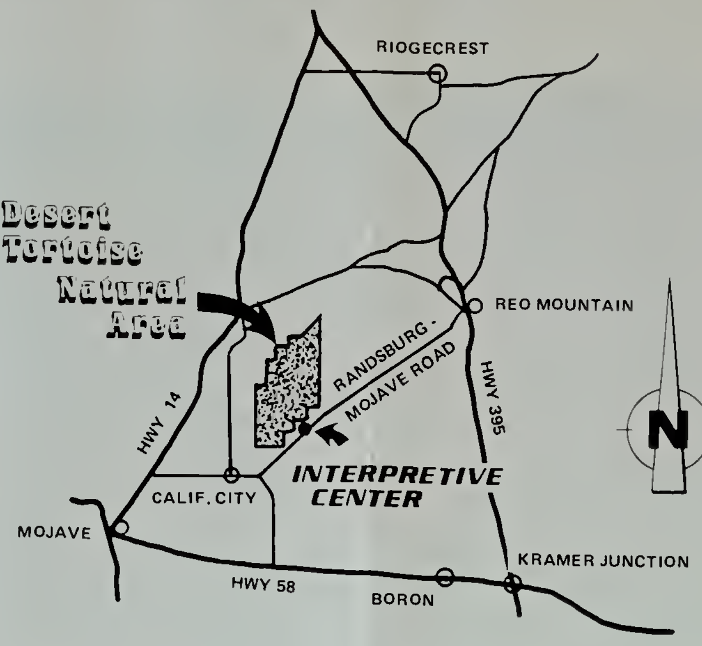
California
DESERT DISTRICT



STATEMENT

"To protect, conserve, and enhance habitat on the DTNA for native species, eliminating sources of deterioration and loss."

The "checkerboard" land ownership pattern in the DTNA is a result of the old railroad grant days, when alternate sections of land were provided to railroad companies to encourage the development of a transportation system that would open up the West. To ensure continuity of management today, the many private land parcels inside the DTNA will be acquired through a partnership of public and private sources.

Acquisition of private lands has a high priority in the management plan. BLM is developing a request for federal Land and Water Conservation Fund money to purchase 3,760 acres of key private lands within the area, and will pursue land exchanges and/or purchase of such parcels, primarily of 40 or more acres in size.

Lands within the DTNA also may be purchased by private companies to compensate for disturbance or loss of tortoise habitat in other areas of the Western Mojave Desert. These parcels would then be donated to BLM for inclusion in the Natural Area. The California Department of Fish and Game, The Nature Conservancy, and the Desert Tortoise Preserve Committee also will be working to purchase private parcels, which then will be added to the Natural Area.

Although the Natural Area is closed to domestic livestock grazing, some sheep grazing has occurred within the area because of gaps in the protective boundary fence. To eliminate this, local grazers will be reminded of the closure, signs will be posted along fence gaps, and the area will be patrolled. If land acquisition projects are unsuccessful, easements will be sought so that a fence can be installed on private lands along the Western boundary of the area.

Unauthorized vehicle access to the DTNA will be eliminated by inspecting and repairing fencing and by increasing surveillance and citation of vandals destroying the fence.

Public Land Order 5694 closed approximately 16,000 acres of public land within the DTNA to mining under the United States mining laws. As new lands are acquired, they are automatically withdrawn from mineral entry under that Public Land Order.

Russian thistle, an undesirable non-native plant, is invading a portion of the DTNA, increasing the potential in some areas for an unnaturally large fire. Under the ACEC plan, Kern County will be asked to develop regulations preventing Russian thistle sources on private lands from adversely impacting adjacent public lands in the DTNA. A weed-burning program will be implemented to destroy accumulated thistle along the fenceline, and efforts will be made to eliminate Russian thistles found growing within the DTNA.

To protect habitat in the vicinity of the Interpretive Center, off-road vehicle travel and camping along the access road or in the parking lot will be prohibited. Boulders will be placed along road edges and around the parking lot to discourage off-road travel. All dogs will be required to remain on leashes in the parking lot and will not be allowed in the DTNA (except for seeing eye dogs).

Fires occurring in the DTNA will be contained and extinguished with water only, and only if necessary. No fire retardant or earthmoving equipment will be used, and pumper trucks will be allowed only on previously established dirt roads.

STATEMENT

"To protect, conserve, and enhance populations of other desert animals and plants to preserve a representative portion of the Mojave Desert ecosystem for research and public enjoyment."

In addition to the desert tortoise, 81 other vertebrate species are found in the DTNA. Protection of several of these, including Swainson's hawk, the Mohave ground squirrel, the burrowing owl, loggerhead shrike, and desert kit fox is of special concern. Collection of reptiles, other animals, and plants within the Natural Area is prohibited, unless it occurs as part of an approved research project.

Large numbers of black-tailed hares and cottontail rabbits have been killed recently at or near the DTNA, which may be reducing food supplies for other wildlife, especially the desert kit fox. Studies will be conducted to determine if such collection is legal, or part of an illegal commercial operation.

STATEMENT

"To promote contemplative recreation and educational activities (e.g., sightseeing, nature walks, photography, hiking, etc.); maintain recreational, scenic, and aethestic values; and protect the safety of visitors."

The Desert Tortoise Preserve Committee and BLM will work together to maintain nature trails within the area, and to develop and provide trail guides and informational brochures for the public. The entire area will be closed to firearms use and to collection of plants and animals.

STATEMENT

"To allow appropriate research and study at the DTNA, while at the same time protecting natural values. Research may be permitted unless it adversely affects the natural environment or conflicts with other goals, projects, and policies."

Research proposals will be reviewed by BLM, the California Department of Fish and Game, and the Desert Tortoise Council, and ongoing projects will be carefully monitored.

STATEMENT

"To maintain an active monitoring program to determine the effectiveness of management actions, the status of desert tortoise populations and other species of concern, the status of habitat, and the integrity of the DTNA and its boundaries."

Actions planned include monitoring tortoise populations on large study plots; studying raven predation; photo monitoring of 30 to 40 sites; maintaining a visitor register and analyzing the data obtained; logging patrol time, citations issued, and numbers and types of visitor contacts; and reporting on land acquisition progress.

STATEMENT

"To maintain the continuity of desert tortoise and other animal populations within the DTNA with animal populations in other parts of the Fremont-Stoddard Crucial Habitat."

BLM and the California Department of Fish and Game will be developing an ACEC management plan for the Western Rand Mountains, protecting tortoise habitat in the Rand/Fremont Valley area, designating limited numbers of vehicle routes, and implementing a monitoring program.

STATEMENT

"To develop and implement a plan protecting the DTNA from impacts that could result from mineral development."

About 1,600 acres of public land in the northern part of the DTNA are currently under lease for oil and gas exploration and development. The lease expires in 1992, and renewal is unlikely because no development has occurred and none is expected. Environmental documents addressing mineral leasing and mineral material sales that would affect the DTNA will be prepared, and decisions will be made to categorically reject all uses that would adversely impact the DTNA.

STATEMENT

"To continue seeking the advice and support of the Desert Tortoise Preserve Committee in implementing the ACEC management plan."

The Desert Tortoise Preserve Committee, a private nonprofit corporation, works closely with BLM, the California Department of Fish and Game, and other private groups to protect the desert tortoise and to establish and maintain the DTNA. A 1986 cooperative agreement ensures the group's continued involvement in implementing the ACEC plan.

What You can Do To Help

Please check any of the items you, or a group you belong to, would be interested in working on. CUT OFF THIS PRE-ADDRESSED, POSTAGE-PAID SECTION AND DROP IT IN ANY MAILBOX.

- ○ *Installing, inspecting, and maintaining fences and signs*
- ○ *Supporting the establishment of local ordinances to protect the desert tortoise and its habitat*
- ○ *Assisting in habitat improvement projects such removing undesirable non-native plants (e.g., Russian thistle)*
- ○ *Assisting in public education efforts*
- ○ *Maintaining nature trails*
- ○ *Photographing monitoring sites*
- ○ *Maintaining visitor registers*
- ○ *Donating funds to:*
  - -- *acquire private lands within the DTNA*
  - -- *print educational materials*
  - -- *purchase and equip a mobile Tortoise Discovery Center*
  - -- *increase desert tortoise monitoring studies*
  - -- *purchase supplies for trail, fence, and sign repairs*

DETACH AND MAIL

☐ *YES – I'd like to be a volunteer for the desert tortoise. Please send more information.*

NAME ______________________

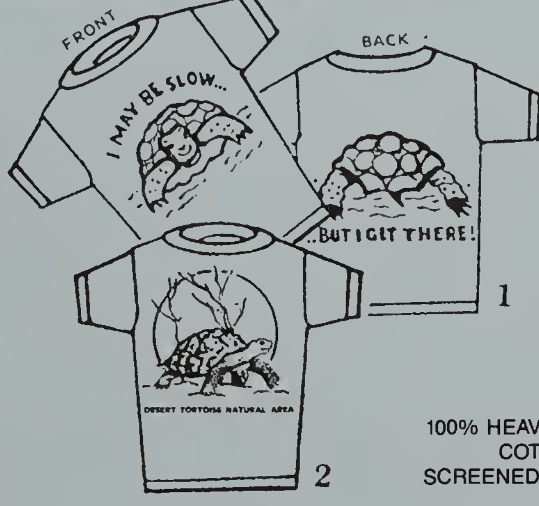
Address ______________________

City,State,Zip ______________________

Telephone (____) ______________________

DESERT TORTOISE PRESERVE COMMITTEE FUND RAISING FLYER

T-SHIRTS



100% HEAVY-WEIGHT
COTTON SILK-
SCREENED DESIGNS

1. *"I MAY BE SLOW . . BUT I GET THERE"*
Design on front and back; blue (B), yellow (Y), maroon (M).

2. *"DESERT TORTOISE NATURAL AREA"*
In beige only, with multicolor design on front.

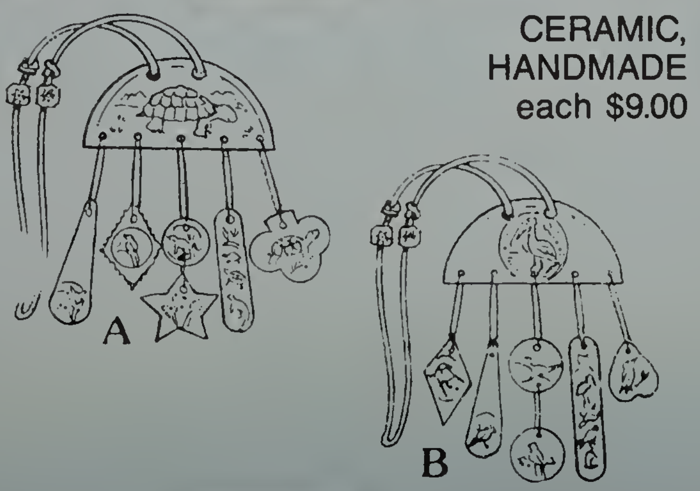
CHILDREN'S SIZES	S, M, L,	$6.60
ADULT'S SIZES	S, M, L, XL,	$9.00

PATCHES

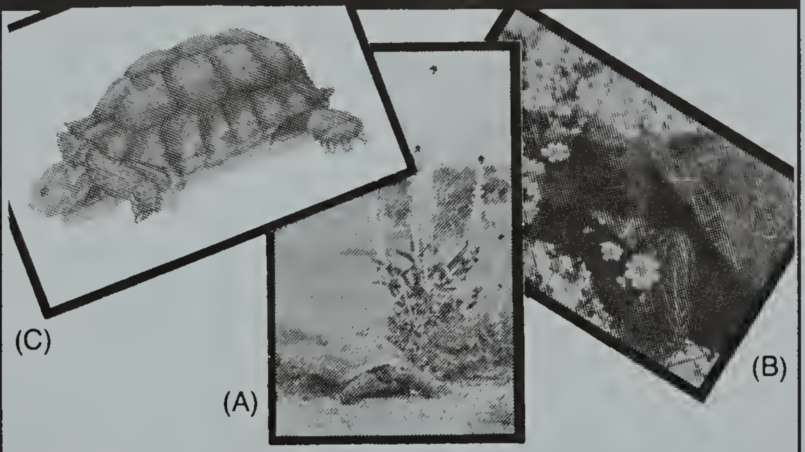
MULTI-COLOR
TORTOISE DESIGN
3½ inch diameter
sew on patch
$2.85

WINDCHIMES

CERAMIC,
HANDMADE
each $9.00



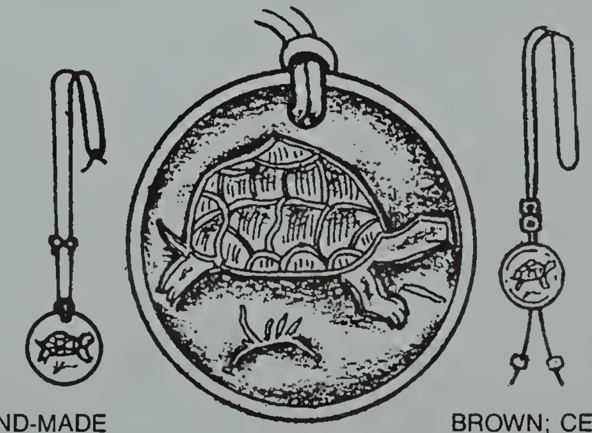
POSTCARDS & NOTECARDS



POSTER (not shown) . . . . "Follow Me To . . . The Desert Tortoise Natural Area" Color Photo: 17"×20"	$1.00
POSTCARDS (A) . . . . Desert Animal and Plant Life; Choice of 7 Color Photos	15c ea. or 7 for $1.00
BORDERED POSTCARDS (B) . . . Tortoise or Kit Foxes; Choice of 2 Color Photos	25c ea. or 5 for $1.00
NOTE CARDS, (C)Tortoise	60c ea. or 10 for $5.00
Owl	25c ea. or 10 for $2.00

Original Watercolors; with envelopes

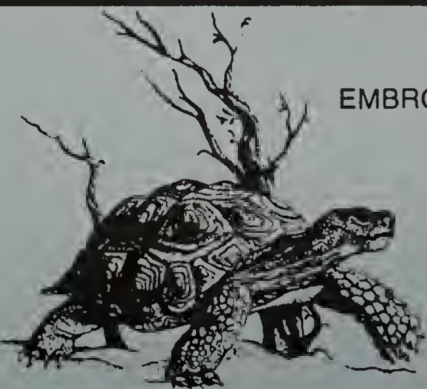
PENDANT / BOLO



HAND-MADE
MATCHING
TORTOISE DESIGN

BROWN; CERAMIC
AND LEATHER
$2.35

EMBROIDERY



CREWEL
EMBROIDERY KIT
$8.00

ORDER FORM

CAROL PANLAQUI (619) 327-7785
DESERT TORTOISE PRESERVE COMMITTEE, INC.
P.O. BOX 453 RIDGECREST, CA 93555

T - S H I R T S

Quantity	Children's (C) or Adults (A)	Size	Color Choice (B)	(Y)	(M)	Price
#1						
#2			BEIGE ONLY			

P A P E R P R O D U C T S

	POSTER(S)	
	NOTE CARD(S), Tortoise	
	NOTE CARD(S), Owl	

P O S T C A R D S

	POSTCARD, Tortoise & Desert Candle	
	POSTCARD, Burrowing Owls	
	POSTCARD, Zebra-Tailed Lizard	
	POSTCARD, Horned Lizard	
	POSTCARD, Mohave Ground Squirrel	
	POSTCARD, Pack Rat	
	POSTCARD, Thistle Sage Flower	

B O R D E R E D P O S T C A R D S

	POSTCARD, Tortoise	
	POSTCARD, Kit Foxes	

W I N D C H I M E S

	TORTOISE DESIGN, Brown $9.00	
	BIRDS DESIGN, Blue $9.00	

M I S C E L L A N E O U S

	PATCH $2.85	
	BOLO $2.35	
	PENDANT $2.35	
	CREWEL $ 8.00 (12" square with yarn, needle, instructions)	
	Total Amount	
	California Residents add 6% Sales Tax	
	Add 20% for Postage and Handling Fee	
	TOTAL AMOUNT ENCLOSED	

P L E A S E P R I N T

NAME
ADDRESS
CITY STATE ZIP

BRIEF HISTORY OF THE DESERT TORTOISE PRESERVE COMMITTEE AND DESERT TORTOISE NATURAL AREA

1972 *Bureau of Land Management acquired 2½ sections in what was to become Desert Tortoise Natural Area

1973 *Bureau of Land Management closed area to off-road vehicle traffic

*Garden clubs began fund-raising drive for fence

1974 *Desert Tortoise Preserve Committee organized

1976 *Bureau of Land Management received Congressional appropriation for development of Desert Tortoise Natural Area

*Desert Tortoise Preserve Committee became project committee of The Nature Conservancy

1977 *Desert Tortoise Preserve Committee purchased 1,400 acres

1978 *Sheep grazing eliminated from Desert Tortoise Natural Area

*Secretary of Interior was petitioned for withdrawal of public lands from public land laws, including mining

1980 *Withdrawal of public lands approved

*Interpretive Center, nature trails and visitor facilities completed

*Dedication of Desert Tortoise Natural Area

1981 *Desert Tortoise Preserve Committee acquired 40-acre parcel

1983 *Desert Tortoise Preserve Committee purchased 40 acres in central region

1984 *6½ acres added

*Petition to U.S. Fish and Wildlife Service to list tortoise as endangered species

1985 *Desert Tortoise Preserve Committee added 10 acres in critical area

*U.S. Fish and Wildlife Service called listing of tortoise as threatened species warranted

1986 *978.5 acres added

PRESENTLY:

*Desert Tortoise Preserve Committee maintaining lands and fence

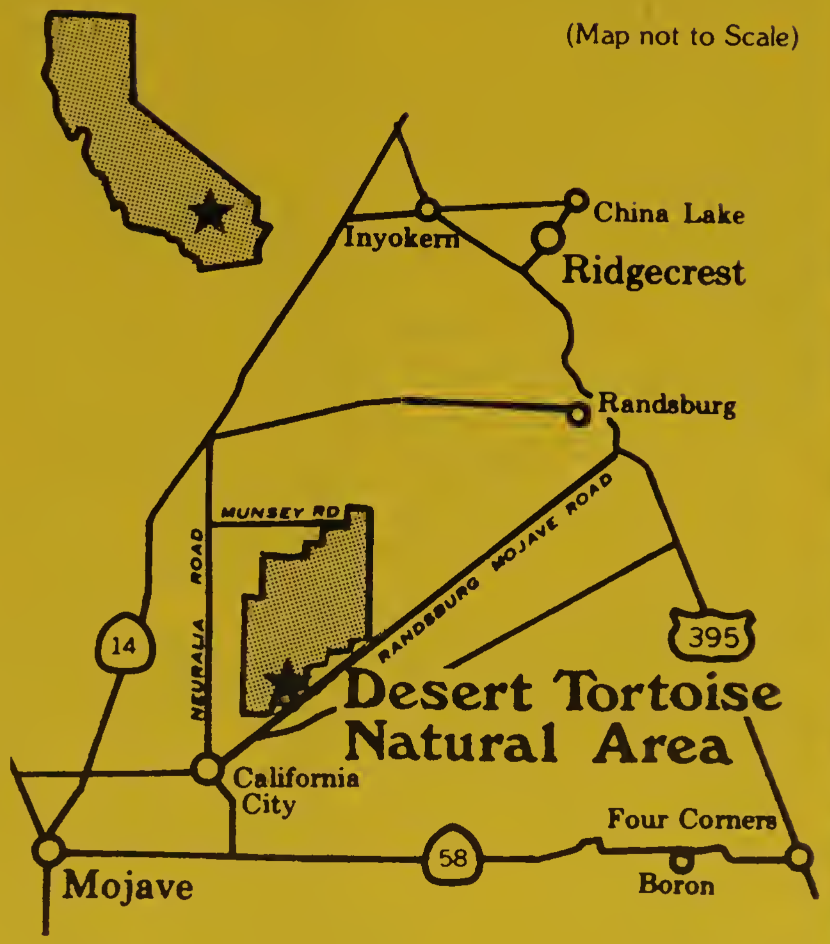
*More land being purchased

NOTE: The Nature Conservancy assists the Desert Tortoise Preserve Committee in land acquisition.

Desert Tortoise Natural Area

ACCESS: From Los Angeles, the Area may be reached by traveling northwest on Interstate 5 to its intersection with Highway 14. Head east on 14 and through the town of Mojave. At California City Blvd., turn right and travel through California City to the Randsburg-Mojave Road (dirt). The Interpretive Center is located approximately 5 miles north of California City Blvd., just off the Randsburg-Mojave Road.

(Map not to Scale)



7 Ways You Can Help:

1. Send a tax-deductible donation
2. Order and display the fund-raising products
3. Join the Committee
4. Write Letters
5. Participate in tour of the Natural Area
6. Join fence and trail repair parties
7. Help spread the word!

LET'S TALK TORTOISE!

DESERT TORTOISE
PRESERVE COMMITTEE, INC.
P.O. BOX 453
RIDGECREST, CA 93555

DESERT TORTOISE PRESERVE COMMITTEE, INC.
P.O. Box 453, Ridgecrest, CA 93555

DESERT TORTOISE PRESERVE COMMITTEE, INC.
APPLICATION FOR MEMBERSHIP

Name ______________________ Date ______________

Address ______________________ Phone ______________

City ____________ State ________ Zip ________ New ______ Renewal ______

I (we) hereby apply for the following membership:

GENERAL:	( )	Individual Membership	$ 10 annually
	( )	Family Membership	$ 15 annually
	( )	Sponsor Membership	$ 25 annually
	( )	Benefactor Membership	$ 50 annually
	( )	Patron Membership	$100 annually
ORGANIZATION:	( )	Available for any amount of above annual dues.	
DONATION ONLY:	( )	Enclosed is a tax-deductible donation of $ ________ No membership is intended	

ACTIVE MEMBERSHIP may be applied for in writing and requires approval by the Board of Trustees

Enclose check and send to:
Desert Tortoise Preserve Committee, Inc.
P.O. Box 453, Ridgecrest, CA 93555

Meet the Desert Tortoise!

The desert tortoise is a remnant of prehistoric life afoot in the desert regions of the Southwest. Its ancestors roamed the earth in the time of the dinosaurs, and managed to adapt to the changes that occurred through the ages.

However, today its future existence is threatened, by both progress and recreation. There has been extensive destruction of the fragile tortoise habitat, including the vegetation needed for food and shelter. In addition, many tortoises have been carried away for pets, and a great number have been deliberately killed with guns or vehicles, by those who apparently derive enjoyment from wanton destruction.

The tortoise is a gentle and slow-moving creature that does not threaten or try to escape; this makes it particularly vulnerable to capture or harm. It is slow to reproduce. Its life depends on the delicate wildflowers and the vital sheltering brush that must be defended against non-native intrusion and human abuse. Despite the fact that the desert tortoise has been named the California State Reptile, neither the tortoise nor its habitat has so far received the protection needed for its continued survival in California or elsewhere. There are two reasons why this protection is urgently needed:

FIRST THE TORTOISE WAS TAKEN AWAY FROM THE LAND. . .for people's pleasure and by the truckload for sale in pet shops. Many of them were shipped east to climates totally unsuitable for their survival, and with no instructions for their care.

THEN THE LAND WAS TAKEN AWAY FROM THE TORTOISE. . .reducing it by the development of towns, roads, utility corridors, alfalfa ranches, etc. Moreover, what is left of the tortoise habitat is being destroyed by excessive off-road vehicle use, livestock grazing, mining and other activities. Large parts of the once ideal habitat are now barren wastelands--scarred by vehicle tracks and denuded of all plant life--where few animals can survive.

However, there is Hope . . .

A dedicated group of volunteers in southern California, called the DESERT TORTOISE PRESERVE COMMITTEE, is asking for your support. Since 1974 The Committee has been working with the Bureau of Land Management and the State Department of Fish and Game to establish the Desert Tortoise Natural Area. It is located in the western Mojave desert, where most of the tortoises are found. The Natural Area was dedicated in 1980, and was designed to save the tortoise from ultimate extinction due to human-related causes. The 38-sq. mile area is protected by a wire fence; high enough off the ground to allow the animals free passage, but keeps out sheep and off-road vehicles.

Here's How You Can Help:

Because there are many pre-existing privately owned land parcels there, the Natural Area and the fence around it cannot be completed until these parcels have been acquired by purchase or exchange. This is being done with the help of The Nature Conservancy, which specializes in land acquisition for conservation purposes. The money needed for these transactions comes from Committee memberships, tax-deductible donations and the sale of fund-raising products. Guided tours of the Natural Area and publicity through slide programs and a newsletter have helped, but much more remains to be done before the tortoise will have all the protection needed for its survival. In addition to the above ways of helping the tortoise, you are invited to take an active part in the Committee's efforts, as your time and talents permit. With your help, the desert tortoise can be saved--IT'S ALL UP TO YOU! ! !

Write for more information or tortoise fund-raising product order forms. To join the Committee, use the handy membership application form shown on the left; or send your tax-deductible contribution to:

DESERT TORTOISE PRESERVE
COMMITTEE, INC.
P.O. Box 453 Ridgecrest, CA 93555

SECTION V. California
Turtle and Tortoise Club

ON VI. TORT-Group,
c. (Nevada)

Articles

the Tortuga Gazette

◆

CALIFORNIA TURTLE & TORTOISE CLUB
VOLUME 25 - NUMBER 4

SINCE 1964
APRIL 1989

WESTCHESTER CHAPTER

Mailing Address
Westchester Chapter-C.T.T.C.
P.O. Box 90252
Los Angeles, CA 90009

MEETS:SECOND FRIDAY-7:30 P.M.
Veterans' Memorial Building
4117 Overland Ave., Kaizuka Rm.
Culver City, California
Thomas Bros.
Guide Pg. 50-B1

Officers		
President:	Cathy Berrett	(213) 649-0578
V.P.:	Walter Allen	(714) 962-0612
Sec.-Treas.:	Betty Chambers	(213) 670-5225

FOOTHILL CHAPTER

Mailing Address
Foothill Chapter-C.T.T.C.
P.O. Box 194
Montrose, CA 91020

MEETS:FOURTH FRIDAY-7:30 P.M.
California Federal Savings
237 N. Myrtle
Monrovia, California
Thomas Bros.
Guide Pg. 29-B3

Officers		
President:	David Kavanagh	(818) 443-2112
V.P.:	Betty Caldarelli	(213) 863-2672

ORANGE COUNTY CHAPTER

Mailing Address
Orange County Chapter-C.T.T.C.
P.O. Box 11124
Santa Ana, CA 92711

MEETS:THIRD FRIDAY-7:30 P.M.
Mercury Savings
8955 Valley View (at Lincoln)
Buena Park, California
Thomas Bros.
Guide Pg. 9-F4

Officers		
President:	Martha Young-Wheeler	(714) 965-0395
V.P.:	Fred Caporaso	(714) 559-0842
Sec.:	Debbie Taylor	(714) 842-3816

INLAND EMPIRE CHAPTER

Mailing Address
Inland Empire -C.T.T.C.
P.O. Box 2371
San Bernardino, CA 92406

MEETS:FIRST FRIDAY-7:30 P.M.
San Bernardino Co. Museum
2024 Orange Tree Lane
Redlands, California
Thomas Bros.
Guide Pg. 28-E1

Officers		
President:	Jayne Chavez-Scales	(714) 792-7025
V.P.:	Madeline Dexter	(714) 885-5187
Sec.:	Vendy Hall	(714) 864-0978

VALLEY CHAPTER

Mailing Address
Valley Chapter-C.T.T.C.
P.O. Box 44152
Panorama City, CA 91402

MEETS:THIRD FRIDAY-7:30 P.M.
Fallbrook Mall Meeting Place
in the Food Court
6507 Fallbrook Ave.
Canoga Park, California
Thomas Bros.
Guide Pg. 12-A5

Officers		
President:	Marc Graff, M.D.	(818) 993-7441
V.P.:	Marilyn Goldenberg	(818) 887-9424
Sec.:	Betty Alice Kinder	(818) 344-5607

Yearly membership in C.T.T.C., including subscription to THE TORTUGA GAZETTE is:

Individual	$10.00
Family	$12.00
Subscription Only	$9.00
Life Membership...$125.00..Family life membership	$150.00
Foreign (USA funds only by USA bank check or USA International Postal Money Order)	$25.00
Canada & Mexico........US Funds only	$12.00

Mail CHECKS or MONEY ORDERS to the Chapter of which you would like to be a member, NOT to the return address on front of the Gazette. Newsletter is the same for all chapters.

GAZETTE MATERIAL- DEADLINE FOR FUTURE ISSUES WILL BE THE FIRST DAY OF THE PREVIOUS MONTH,..UNLESS OTHERWISE NOTED (DUE TO VACATIONS, ETC.). MAIL MATERIAL TO : C.T.T.C., P.O. BOX 8952, FOUNTAIN VALLEY, CA 92728.

Photos and drawings will be used if there is space, and if the budget allows. They will be returned to you if you desire. The more contrast in the photo, the better the reproduction. Please clip any turtle or tortoise articles in the newspapers or magazines and share them with other members by sending them to us. All members and subscribers are invited to send us short stories or articles on their turtles or tortoises.

ADVERTISING IN THE GAZETTE- one-fifth page. Will run 3 months. Turtle related items only. Ads accepted at discretion of the Editor. Rates: Club members and subscribers............................$15.00

* * *

APRIL PROGRAMS

PALM DESERT- Meeting date is Monday, April 3 at 7:00 P.M.-Jim St. Amant of California Fish & Game will speak on Desert Tortoises in the Wild at the Living Desert Reserve. On Saturday, May 6th at noon there will be a "bring your own picnic show and tell". Please bring your animals to the Palm Desert Community Park off Portola. No meetings in June, July or August. See you Monday, September 11th at 7:00 P.M.

INLAND EMPIRE: Meeting date is April 7. Fred Caporaso will speak on his latest trips to Costa Rica and the sea turtle conservation projects he is working on with Walter Allen, Peter Pritchard and the Costa Rican government. May 5, Walter Allen will talk about the building of Casa de Tortuga II.

WESTCHESTER: Meeting date is April 14. “Something Nobody Else Has” a video on the Alligator Snapping Turtle. May 12, Fred Caporaso will talk on Costa Rica trips # 3 & 4.

ORANGE COUNTY: Meeting date is April 21. Norm Edmonston, expert hobbiest, will talk about his 30 years experience with the Desert Tortoise and various water turtles.

VALLEY: Meeting date is April 21. Dana Sanburg, research assistant with CSUN, will speak on Indian uses of Turtles and Tortoises.

FOOTHILL: Meeting date is April 28. Program to be announced.

COMING EVENTS

April 23- Orange County Chapter’s annual show. See page 12.

May 21- Valley Chapter’s annual show. See page 12.

June 18- Westchester Chapter's anual show. See details next month.

June 20-24- The International Herpetological Symposium, Phoenix, Arizona. Contact person is Roger Klingenberg, D.V.M. (303) 351-0936.

September 11-19- First World Congress of Herpetology, University of Kent, Cantebury, United Kingdom.

Walter Allen, Editor (714) 962-0612
Fred Caporaso, Ph. D, Technical Advisor (714) 559-0842

TURTLE OF THE MONTH

Trachemys scripta elegans—the red-eared turtle

(formerly *Pseudemys scripta elegans*)

by Peter C.H. Pritchard

The red-eared turtle, *Trachemys scripta elegans,* is also known as the red-eared slider, the dime store turtle or the elegant terrapin. It has a wide range from Texas and Mexico, north to Ohio and east to Georgia, where it intergrades with Pseudemys scripta scripta. This race is immediately recognized by the red or reddish-orange streak behind the eye, present in all but a few individuals. The plastron bears a regular pattern of dark-bordered blotches much more numerous than in the usual examples of Pseudemys scripta scripta, although in both races the number is very variable. It reaches an average size of ten inches at adulthood. Average eggs laid is 10, although 5 to 23 have been recorded.

The turtle disease that has attracted the most attention in recent years is salmonellosis, since this disease can be passed on to humans. Salmonella, the organism responsible for salmonellosis, is a genus of bacteria of which about 1400 "species" (serotypes) are known. Closely related is the genus Arizona, distinguished by its inability to ferment lactose, of which about 400 serotypes have been identified. Salmonella is a very widely distributed organism and certainly is by no means confined to turtles. Infection can be serious in humans, particularly very young or very old people; it manifests itself by fever, stomach and intestinal upsets, nausea, etc.

Salmonella is present in about 80% of samples of supermarket chicken and can even be cultured from about 13% of a random sample of coins and banknotes. It has also been identified in imitation ice cream, commercially baked meringue pies, nonfat dried milk, eggs, fish, pork, beef, potato salad,lemon tarts, spaghetti, cheese, candy, and lipstick. The organism multiplies either in the gall bladder or the kidney pelvis of infected host animals; the former is the most common location. Turtles, of course, have to be exposed to Salmonella before they can carry it, and herein lies the cure. If turtles are maintained in clean conditions and not fed on raw offal and other fertile sources of Salmonella, they are unlikely to acquire the organism or transmit it to humans. I might add parenthetically that I have kept dozens of turtles for many years and have fed them on a wide variety of foods with no attempt to check for possible Salmonella introduction, and have never suffered from any symptoms of salmonellosis. However, it is possible that children who embrace or kiss their pet turtles may run the risk of catching the disease, and such close contact should therefore be discouraged. Certainly the "dry bowl" method of raising baby turtles, whether or not required by law, has nothing to recommend it and should not be used. The present legislation restricting sales of baby turtles, while doubtless carrying a humanitarian side benefit in saving thousands of turtles from a premature death in the hands of youthful owners, is not justified on health grounds since not only the substances listed above, but even domestic dogs, cats, and birds can be sources of infection. In other words, we run a constant risk of contracting salmonellosis whatever we do, and that risk is only negligibly increased by keeping pet turtles.

Reprinted from: *Encyclopedia of Turtles* and *Living Turtles of the World*

TURTLE OF THE MONTH -- Continued

In captivity- by Fred Caporaso

Almost all of us can remember seeing hatchling red-eared turtles for sale in our local pet shop a few years back. Unfortunately, the majority of these poor animals never had much of a chance to survive. Often it was a case of the "blind leading the blind". Customers saw a cute colorful animal that seemed easy to care for, and retailers, knowing little about turtle care, sold them in a plastic dish with a palm tree and a container of dried insect parts. The results were disastrous in most cases. Although sale of turtles under four inches in length is now prohibited in the U.S.A. (see Salmonellosis in previous section), the travesty continues. Turtle "farmers" are simply exporting them to Europe, Japan, etc. in greater numbers. In fact I've seen them for sale in Costa Rica! Hopefully this practice will be stopped shortly (see the article in next month's Gazette). In the meantime please try to educate your local pet shop personnel in the proper care techniques for their turtles. Try giving them some CTTC care sheets, a Tortuga Gazette and a club application.

Red-eared turtles do well in captivity if one pays proper attention to their needs. As with most water turtles the best results require: temperature control, clean water, proper diet, a good light source, and a place to bask.

Indoors they should be kept at between 75-85°F. A basking spot, with a nonabrasive surface (to avoid shell damage), should be placed under a good light source. In the wild "red-ears" are mostly carnivorous (meat eaters) when young and become more omnivorous (meat and plant eaters) later in life. My captive "red-ears," some I maintained for more than 13 years, have been carnivorous and pay little attention to the plant material I have offered them as food. I feed mine a variety of things including, semi-moist cat food (it's a complete diet and a good source of needed vitamins and minerals, especially vitamin D, for turtles that don't get much unfiltered sunlight), trout chow, whole fish and smelt.

They are attractive, hearty and active. Living in Southern California, I am able to keep my adult "red-ears" outside year round in an unheated pond. I recommend them highly for anyone interested in keeping water turtles as pets.

This is what a baby Red-eared Turtle looks like when he grows up.
A. VAN DEN NIEUWENHUIZEN

TORTUGA NEWS TIDBITS
"TNT"

The purpose of this section is to be a forum for the membership to share information on topics such as captive breeding success (what, where, when and how), new husbandry techniques regarding diet, housing, temperature control, lighting, sanitation, general health hints, etc., or just questions about any of the above. Please send your "tidbits" to **Tortuga News Tidbits** c/o Fred Caporaso, 57 Carson, Irvine, CA 92720.

MUSK TURTLES: If you are an owner of a loggerhead musk turtle or any of the musk turtles, be sure you provide your friend with a "house" or cave of his own to hide and sleep in. This seems to be as important to the well-being of the musk turtle as a basking area is to the emydid (pond) turtles. I have a very large tank containing several species of water turtles. The loggerhead has always been provided with a small flower pot placed on its side so she can enjoy a cozy shelter all her own.—C.M.

YOUNG TORTOISES: I have found that my young tortoises enjoy climbing over things such as low rocks, boards or even shoes in a closet or anything that is very low but offers an exciting challenge to the tortoise eye. We have a small area in our yard that is set up as a tortoise "playground". It is very safe and provides them with hours of interesting climbing fun. The exercise seems to help stimulate their elimination systems and keeps things moving along in a healthy manner.—C.M.

TORTOISE DIET: Tortoises need lots of fiber in their diet. To get it, tortoises with the opportunity will eat dried up old twigs and other dead and dried up vegetation, stuff that looks very unappetizing to humans. To assist my hatchlings in getting more fiber, I offer them a little Shredded Wheat cereal. My very young hatchlings enjoy Spoon Size Shredded Wheat that is broken up to accommodate their little mouths.—Christine Meek, 8136 Ranchito Avenue, Panorama City, CA 91402. Christine, thanks for the tidbits. I love Shredded Wheat myself! Suggest you try alfalfa pellets from your pet shop (grind it up and sprinkle on other food); it is an excellent source of fiber and has a better calcium to phosphorus ratio than Shredded Wheat(4.5 to 1 vs. 0.2 to 1). See MORE ON CALCIUM on the next page.—F.C.

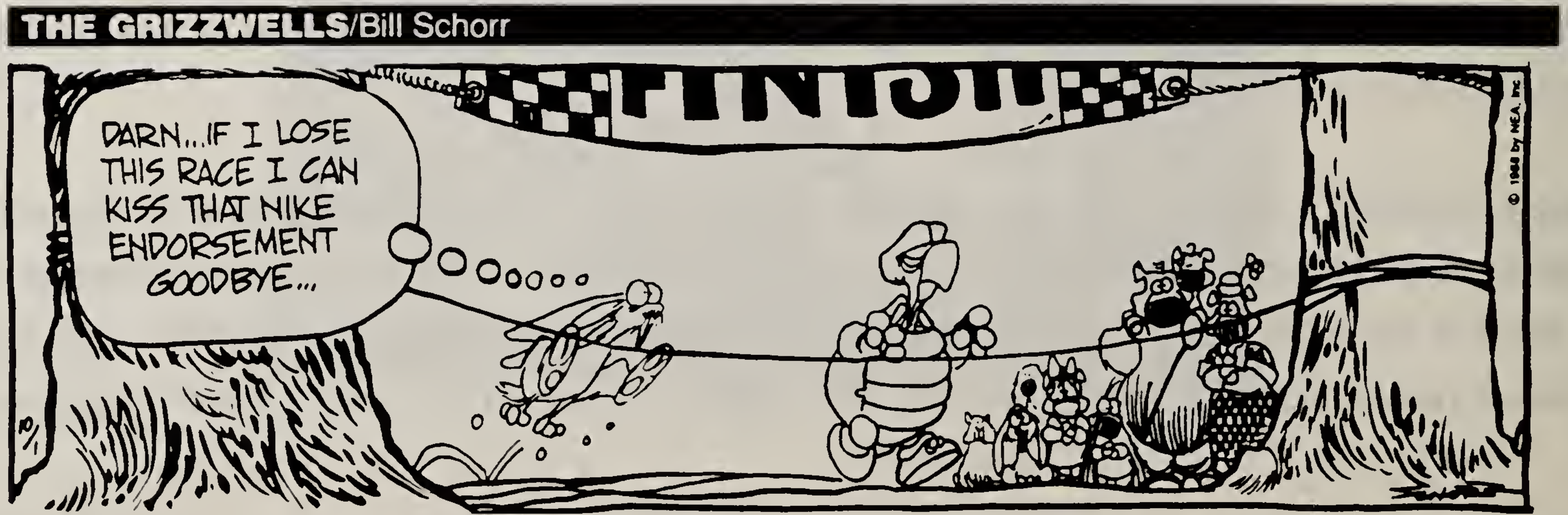
TANK DEBRIS: R. D. writes that he has two red-eared sliders set up in a 20 gallon tank with a Magnum 330 filter. "I'm still getting debris on the bottom of the tank. I'm wondering if I could use a snail or an algae eater in the tank without causing problems for the turtles. Can you help ?"—Robert Danielle 740 27 th SE, Auburn, WA 98002. The size of your sliders will determine if your snail will be a cleaning aid or just extra food for the turtles. Others, including myself, have had success adding an extension onto the intake tube for the filter, so that it reaches closer to the bottom of the tank. You pet shop should have one that is made for your filter.—F.C.

BREEDING SUCCESS: Congratulations to John Behler and his staff at the New York Zoological Park for what is believed to be the first zoo hatching of the Vietnamese box turtle (*Cistoclemmys galbinifrons*). Two eggs hatched after a 73-day incubation period at 27-28° C. C.T.T.C. members might remember that Walter Allen also hatched a Vietnamese box turtle last year.—F.C.

MORE ON CALCIUM: The importance of calcium in the diet of reptiles, especially turtles cannot be over stressed. Dr. Lewbart's tidbit in last month's Gazette should be reviewed and remembered.

The calcium to phosphorus ratio of the diet should be approximately 2 to 1 (some say as low as 1 to 1 is O.K.). Also, Vitamin D_3 (the biologically active form of Vitamin D) is needed for calcium and phosphorus to be absorbed. Problems most often arise in captive hatchlings, which have an increased requirement for shell growth, and our California desert tortoise. Too often captive desert tortoises are fed supermarket fruits and vegetables which have a poor calcium to phosphorus ratio and a high water content. Tomatos for example are 94.5% water and have a calcium to phosphorus ratio of 0.5 to 1. On the other hand, the Bermuda grass found in many back yards is much better at 63.3% water and a Ca:P ratio of 2.4:1. Al the pelleted alfalfa meal mentioned earlier is a great dietary supplement at 8.1% water and a Ca:P ratio of 4.5:1. In the wild foxtail brome, at 64.1% water and a Ca:P ratio of 1.2:1 is typically eaten.—F.C. (In July, the desert tortoise issue of the Gazette, I'll have the nutritional analysis of more foods eaten by desert tortoises in the wild and in captivity.).

HERP TRIVIA: What reptile was recently named the State Reptile of Georgia? The gopher tortoise, *Gopherus polyphemus* (a close relative of our own desert tortoise). **Reprinted from GA Herpnotes Jan./ Feb. 1989. Keep those cards and letters coming!**


THE GRIZZWELLS/Bill Schorr
FINISH
DARN...IF I LOSE THIS RACE I CAN KISS THAT NIKE ENDORSEMENT GOODBYE...
© 1988 by NEA, Inc.

MILDRED AND GERTRUDE-ALIVE AND WELL

by Allan P. Hurst

I own two animals, myself — “Mildred Pierce”, an inquisitive and highly personable 40-year-old Three-Toed American Box Turtle, and “Gertrude Stein”, an 8-year-old Hermann's (“Greek”) Tortoise. I acquired both by accident.

Mildred found me from the window of a San Francisco pet shop. She was being very observant, tracking all motion and persons within her range of vision. I tapped on the glass, but she didn't pull in. In fact, she stuck her head out even further to examine me just as carefully as I was examining her! I fell in love with her and always having a soft spot for turtles and tortoises (I'm allergic to any animal with fur, and raised tortoises for many years when I lived in Chicago many years ago), I purchased her on the spot and took her home. It turned out that she wasn't very pleased with my choice of fresh fruits and vegetables for her..she ate haphazardly, but she really wanted something else. After a few days, in utter disgust and desperation, I gave her a small portion of lasagna left over from dinner. She literally dove into the plate, and began eating so forcefully that I was afraid she'd hurt herself or choke. Clearly, I had a turtle on my hands that was not only omnivorous, but also thought it was a human! As the days went by, I experimented some more, and found that she liked a mixture of fresh fruits, vegetables, meat, and “people food” such as lasagna, noodles, chinese food (especially pot-stickers), chicken, and cooked ground turkey or hamburger. When I took her to see a vet in SF who specializes in herbs, the receptionist asked me what Mildred ate. “Lasagna!” I said, and a legend was born. I became “the man with the turtle who likes lasagna”.

Gertrude came to me through Mildred's vet. Gertrude was a young Hermann's Tortoise who had been selected for a man as a gift, but who had been badly neglected. She hadn't been fed proper food for months, and had been kept in cold dark boxes with only a little water every few days along with whatever scraps had been thrown her way. Although she was the size of Mildred (about 7" long), she weighed only a few ounces, and was clearly on the verge of death. The vet was about to put her to sleep when Gertrude's new owner, the woman who had given her to the man originally, offered to nurse Gertrude back to health and not give her back to the man. The vet agreed, but it became clear that the woman wasn't up to 24-hour nursing of a sick reptile. Remembering that I had nursed one of my tortoises through a long period of sickness successfully, my vet suggested that the lady give Gertrude to me. In return for my taking Gertrude, the vet added, she'd waive Gertrude's initial medical bill, if only to see her brought back to health.

Every day, I woke up and gave Gertrude vitamin injections. I had fixed up a cage with a heating pad to keep her warm, and left one end of the cage in sunlight so she could crawl into the light when her eyes adjusted better. She just slept and breathed heavily for the first few days. I kept replacing her old food and water with fresh food and water, but she just didn't seem interested. At my vet's suggestion, I tried giving her some scrambled eggs. Gertrude struggled to her feet and tried eating them, but her jaws were just too weak! Encouraged by her willingness to eat, I then soaked some bread in milk and put that into her cage, hoping that it would be soft enough for her to chew. It was! She ate like a maniác, stopping to rest only long enough to gather her strength to continue eating. At the end of half an hour, she had devoured half of the bread, then retired to the corner to sleep. Feeling better, I cleaned up the remaining food and went to bed.

In the morning, I was wakened by a strange CLUMP-THUMP-BUMP noise in the bedroom. Looking u I found to my utter shock and joy that it was Gertrude, nosing around the cage trying to find the rest of t food that had been there yesterday! I dashed into the kitchen and slapped together more bread-and-milk, sprinkling it liberally with Super Preen bird/reptile vitamins. As before, she devoured it happily. Over the next two weeks, she continued to eat and move around, and I was relieved to be the owner of a bright, alert, and increasingly stronger tortoise. One sign I found especially heartening was that Gertrude started trying (and eventually succeeded) to lift her body off of the ground when she walked around, rather than just dragging herself forward with her feet. She gained weight steadily, eventually catching up with and then eclipsing Mildred in poundage.

Three months later, I took "the girls" in to see their vet. She was pleased to see Mildred, but couldn't BELIEVE how wonderful Gertrude looked. At one point, she accused me of switching tortoises on her!

Since then, Gertrude has continued to thrive and prosper, though now she eats a more balanced diet of fruits, vegetables, breads, and the occasional commercially-prepared turtle food, which I give her as a special treat. She has grown over 10" in length, and is now almost precisely twice as long and wide as Mildred, and far heavier.

I'd love to hear from any other 3-Toed or Hermann's owners in the CTTC about their animals, too! I can be reached at the below address.

2228 S. El Camino Real, # 315
San Mateo, CA 94403-1853
(415) 572-9512

Shell Game

"How come I'm sticking my neck out — and you're getting ahead?" That's what Speedy, a gigantic 300-pound Seychelles land tortoise, seems to be thinking as he gives a lift to his little pal Archie, a Greek turtle. The amazing double-decker duo live at the Welsh Mountain Zoo in Wales.

A TURTLE TRAVELOGUE

by Donna Waddell

One Sunday afternoon in Milford, Delaware, my son Frank, who is a Pastor there, his wife Janet and their two children, Lesleigh and Benjamin, were returning from church. They saw beside the road a small turtle on its back. It apparently had been grazed by an automobile and flipped through the air onto its back.

They stopped, picked it up and took it home. Its shell was cracked and it was bleeding. They phoned me long distance for advice and I offered whatever advice I could. The turtle recovered, but with the onset of winter he refused to hibernate, so he was brought into the house and placed in a box. Not having the means to care for him properly through the winter, they decided to send him West to me via Janet's brother Alfred who had been visiting from Pasadena. The box turtle was placed in a small box with airholes and carried on board the plane inside the carry-on luggage that was opened for air after boarding.

From LAX Alfred dropped him off to my other son Phil in Van Nuys who phoned me to report the turtle's safe arrival there. Phil said, "Mom, this turtle is really scrutinizing me, with his bright red eyes, he really is a nice fellow." Phil met us in Ventura the next day with the turtle.

Upon his arrival in Santa Maria he was placed in the pen with the other turtles. He seems to approve of his new home and friends, ate a hearty meal and made himself at home.

In trying to think of a name for him, we thought of traveling-type names such as Gulliver or just Traveler. Janet and Frank had named him V. W. So V.W. it is...........Volkswagens travel too, right !?!?

1278 Barnette Rd.
Santa Maria, CA 93455

SUCCESS WITH A LEOPARD TORTOISE

(*Geochelone pardalis babcocki)*

by Larry Cartmill

After many years of keeping snakes and several varieties of aquatic turtles, I decided to expand my menagerie to include an animal considered to be somewhat difficult to maintain. I encountered a beautiful leopard tortoise (*Geochelone pardalis babcocki)* in a pet shop and the tortoise seemed to be alert and in fine condition. It had a carapace length of approximately 10 inches and had 15 growth rings. I purchased the tortoise at a fair price and brought her home to her new surroundings.

I searched through my books and literature to find information on the care and maintenance of leopards and was a little dismayed at the scarcity of material. I then turned to help from some people who had more turtle experience than I. I was quickly informed that because I live in the Ohio Valley, which has very high summertime humidity, the animal probably wouldn't make it through the summer months. I decided to keep her and take a chance anyhow because she seemed so healthy.

As soon as the weather warmed up to springtime norms, I allowed her to graze in the yard, where she munched on the available greenery and enjoyed the natural sunlight. She preferred dandelion leaves, clover, and the leaves of my yucca plant. I supplemented this diet with romaine lettuce, carrots, and a multi-vitamin called "Reptovite". I was very cautious not to put her out when the humidity reached 85% and I never exposed her to rain. I gave her access to a water bowl once a week but never observed her drinking or bathing. Apparently the need for moisture was satisfied through the lettuce.

As the summer of 1988 progressed, the heat and the humidity was extreme, so I limited her outside grazing to early morning and late afternoon. As cool weather approached she seemed in better shape and had survived the hot months with no apparent ill effects.

This winter I kept her inside a room where the temperature stays at 80-82º F. I have used a "plant-Gro" spotlight (60 watts) for additional heat and simulated sunlight, with humidity being maintained at 70%. Her winter diet has consisted of a salad of romaine, endive, cabbage, carrots, and an occasional strawberry and tomato. These meals have been supplemented weekly with vitamins and offered every other day.

As of this date (mid-January 1989) the tortoise has grown over 0.5" and has shown no signs of respiratory or eye problems. All indications are that she has done very well for one year and, hopefully, the trend will continue. If she has acclimated to her new environment, I don't think her health will decline.

My main reason for sharing my success with NOAH members is so others may benefit from my methods. I would also like to hear from anyone else who has been successful with leopards, as I would like to expand my collection and try some breeding if it is feasible. As previously stated, I have been unable to find much written information on this species, so any documentation of someone else's successes and setbacks would be most helpful.

Reprinted from NOTES FROM NOAH- Volume XVI, No. 4, January 26, 1989

THESE TURTLES FREEZE, BUT THAT'S OKAY

Residents of northern climes will note that few reptiles share their environment. Those that do, generally take elaborate measures to deal with frigid temperatures, such as, hibernating underwater or in deep underground dens. But the young painted turtle has evolved a simpler strategy: It freezes.

Researchers removed 13 hatchlings from their winter nests and transported them in a bed of sphagnum moss to nearby Carleton University in Ottawa, Ontario. There, they froze a box of four hatchlings to 24.8°F, and two more hatchlings to 12°F. After 24 hours, all hatchlings were thawed back to 32.6°F. The entire 24°F batch survived, even though in average 52 percent of the body water in each froze solid. Just one turtle frozen to the lower temperature survived. Survival seems to depend on how much body water freezes: Anything much above 54 percent appears lethal, the researchers say.

Freezing doubled blood levels of glucose, tripled liver glucose levels, tripled blood glycerol levels and increased amino acid levels in blood 2.25-fold over those of nonfrozen hatchlings taken from the same nests. The researchers suspect that glucose and glycerol, which can limit freezing in bivalves (SN:7/4/87,p.9), also may have played a role. However, high levels of these chemicals apparently don't entirely explain the animals' survival, the researchers add, since painted turtles observed after spring freezes have survived "depite low levels of cryoprotectants".

While four frog species share a similar tolerance to freezing, the painted turtle is the only reptile and "the highest vertebrate life form known to tolerate the natural freezing of extracellular body fluids during winter hibernation," write Kenneth B. Storey and his co-workers in November 1988 *Proceedings of the National Academy of Sciences* (Vol.85, No.22). An understanding of how these animals survive could suggest techniques for cryopreserving human organs (SN:8/29/87, p.138).

Reprinted from Science News Vol. 134, No. 24 Dec. 10, 1988 p. 382.
Sent in by Mike Brown, P.O. Box 5372, Carmel, CA 93921

ATTENTION MEMBERS!

After 10 years of service as the Assistant Editor of the *Tortuga Gazette* Martha Young-Wheeler has decided to resign her post. We appreciate all Martha has done over the years to assist in keeping the Gazette an informative and interesting publication for the membership.

Please note that all correspondence for the *Gazette* should be sent to: Editor, *Tortuga Gazette* , P.O. Box 8952, Fountain Valley, CA. 92728 or call Walter Allen at (714) 962-0612.

The California Turtle & Tortoise Club
Valley Chapter Presents

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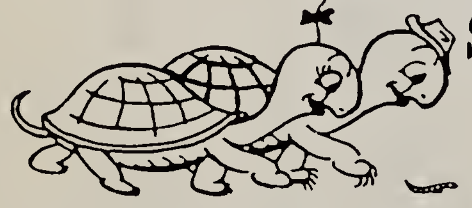

SUNDAY, MAY 21, 1989
10:00 A.M.–4:00 P.M.

SET-UP TIME: 8:00–9:30 A.M.

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additional Information, Call:

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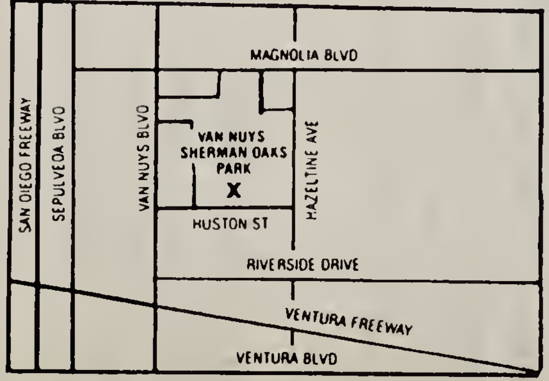
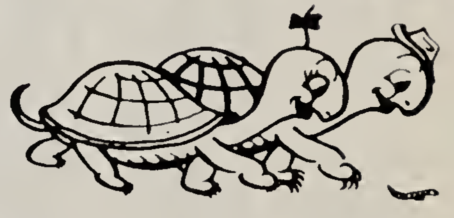
On Day of Show Call: (818) 783-5121



The 13th Annual Orange County TURTLE and TORTOISE SHOW



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Shellie – (714) 870-9696
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FOR SALE: The South African Tortoise Book-A Guide to South African Tortoises, Terrapins, and Turtles by Richard C. Boycott & Ortwin Bourquin. 148 pages, 56 color plates, many black & white. Covers feeding, breeding data, range maps, etc. Price: $24.95-plus $1.50 postage-total $26.45. Send order to: C.T.T.C., P.O. Box 8952, Fountain Valley, CA 92728. Discounts on orders of 12 or more--call (714) 962-0612.

FREE BOOKLET: CARE OF WATER TURTLES...Send $1.00 for postage and handling to : C.T.T.C., P.O. Box 8952, Fountain Valley, CA 92728.

FOR SALE: 10 volumes of Dr. Rosskopf's medical articles. All on turtles and tortoises, approximately 40 articles in all...$20.00 includes postage and handling. Order from: C.T.T.C., P.O. Box 8952, Fountain Valley, CA 92728.

FOR SALE: Turtles of Micronesia by Peter Pritchard, Very rare book printed in 1977, 85 pages all about sea turtles of the Western Pacific in complete detail. Price: $27.45, includes postage and handling. Order from: C.T.T.C., P.O. Box 8952, Fountain Valley, CA 92728.

FOR SALE: The Great Ridley Rescue Book by Pamela Phillips, illustrated by Janie Lowe, 170 pgs., many color photos. Describes the history and habitat of the Kemp's ridley turtle and past and present efforts of humans to save it from extinction. Price: $21.45, includes postage and handling. Order from: C.T.T.C., P.O. Box 8952, Fountain Valley, CA 92728.

FOR SALE: Box Turtle Lapel Pins-Reproduced from U.S. Postage Stamp. $4.00 each- Call: Debbie (714) 842-3816.

FOR SALE: Large Burmese Brown Tortoise--Approximately 3 feet total length, 2 feet straight line measure--52 pound male. Very healthy, has just had annual vet physical and has had all shots and was dewormed. Moving and cannot take with us. $1200.00 or best offer. Will consider partial trade for exceptionally large California Desert Tortoise. Call: (805) 498-7229--leave message.

FOR SALE: Leopard tortoises, captive bred, 5-10", $50.00 to $100.00. (714) 870-9696. Southern California only. Will not ship.

FOR SALE: Two homemade tortoise terrariums with both incandescent and flourescent fixtures. 28"x11"x16.5" $65.00 and 47"x16.5"x13" $85.00. Call Ken (213) 271-5576.

Hi! I'm Henry. I'm a tortoise, really! My owners placed an ad in the *Tortuga Gazette*, and Mr. Owner got more response than I did. And I'm even cuter. Good thing Mrs. Owner has a sense of humor! We're endangered, right? Gotta do our job and propagate, right? I've got a house by the beach with solar heated porch, grassy lawn, fresh veggies, nursery, nearby schools, and two well trained owners that I'd like to share with Ms. Right. Plenty of room for little ones. Pension plan, and full medical benefits available. Please, only honest to goodness female tortoises need reply; as Mrs. Owner's humor is wearing thin. Contact: "Henry" The lonely California Desert tortoise, c/o Mr. & Mrs. Jeff Price, P.O. Box 5747, Santa Monica, CA 90405 or call (213) 828-1977.

SURPLUS: cb 1986 7-*Clemmys guttata*, 5-*Rhinoclemmys areolata* WANTED healthy, long-term captive 0.2 *Testudo graeca*, 0.2 *Testudo horsfieldi*, 1.1 *Clemmys insculpta*, 1.1 *Hydromedusa tectifera*. Contact: Dr. Harold Wahlquist, 1346 Arlene Court, Lilburn, Georgia 30247.

WANTED: 8 Female Spotted Turtles (*Clemmys guttata*), 4 Female Florida Box Turtles (*Terrapene carolina baun*), 1 Male, 2 Female Muhlenberg turtles (*Clemmys muhlenbergi*) For captive breeding. Call: (718) 837-7231 7 to 10 P.M. or write: Vincent J. Congro, 2031 73rd St., Brooklyn, NY 11204.

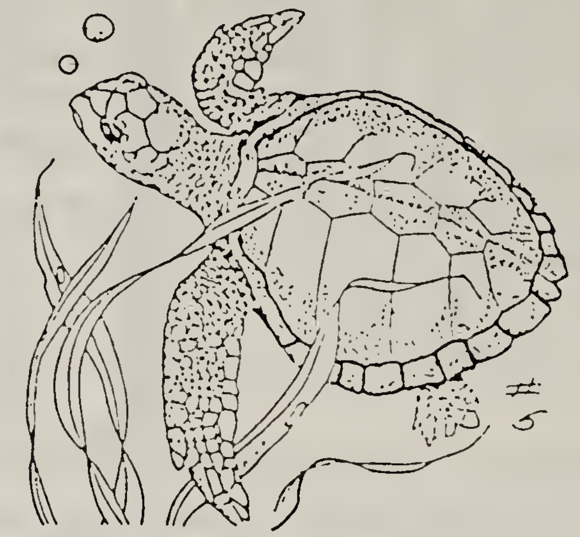
ATTENTION: AN INCREASE IN AD RATES: For new ads being placed starting January, 1989 the rate will be $15.00 for a three month ad.

NOTE: The California Turtle & Tortoise Club is not responsible for turtles or tortoises or merchandise placed for sale in THE TORTUGA GAZETTE. Please allow 4-6 weeks for delivery of merchandise.

BACK BY POPULAR DEMAND... #2 Eastern box turtle and two sea turtles -- tees and sweats.

Box turtle: brown ink with red eye and name on silver, cream, ecru, tan, heather and banana. A FEW sweats in blue, gold, white, peach, lemon. NOT ALL COLORS IN ALL SIZES. Tees in first five colors only. Ridley sea turtle (#5) in dark olive turtle with green leaves and loggerhead sea turtle in brown turtle/green leaves and names. Design front only. Shirts in ice green, aqua, light blue, silver, ecru with dark tortoises; also ivory tortoises, green leaves on periblue, black, aqua. Tees: $10.00 each, sweats: $20.00 each, including shipping. Send check with order to Ellen Nicol, Rt. 1 box 1367, Anthony, FL 32617. Call (904) 622-4850 any time to inquire about color and size availability. Box turtle shirt has design on back. Quantity discounts available for organizations or large orders shipped to one address at one time. Inquire if interested. Also available NOW tokay gecko shirts (silver, blue, heather, ecru, tan.) Outline and name in black, orange and blue spots on back in puff ink (raised). Tees and sweats, same prices.

BOX TURTLE
(Terrapine c. carolina)



ATLANTIC RIDLEY SEA TURTLE
(Lepidochelys kempi)

LOGGERHEAD SEA TURTLE
(Caretta caretta)

CALIFORNIA TURTLE & TORTOISE CLUB
P.O. BOX 8952
FOUNTAIN VALLEY, CALIFORNIA 92728
U.S.A.

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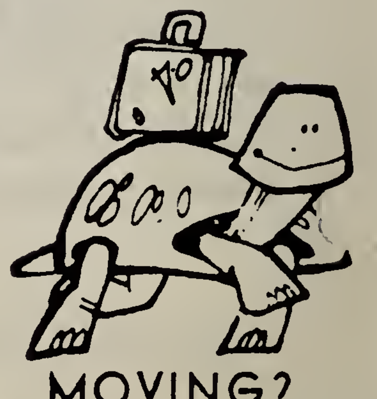


MOVING?
PLEASE LET US KNOW

AVOIDING CROWDING AND PLANNING FOR COMPATABILITY AMONG YOUR TORTOISES

There is no strict rule to follow in order to avoid crowding. It is not so much the amount of space in your yard but how it is arranged and how well the needs of the tortoises are met. For example, are there enough coversites of various kinds, that is, long burrows (4-6 feet), short burrows, semi-sheltered places such as shrubs or low overhangs, all where the soil remains dry? Are there places to bask on dry soil? Is there growing vegetation to eat? Small tortoises must have burrows into which adults cannot go.

Individuals show preferences for particular coversites and as temperatures change, preferences change. Some tortoises use the same coversite for most of the year, moving to another for hibernation; others change frequently. In the wild, depending upon the size of the tortoise's home range, an individual may repeatedly use 12 - 24 coversites of various lengths. The wild tortoise spends approximately 95% of its life in coversites.

Tortoises share their coversite, sometimes simultaneously. You must watch for traffic jams that may result at popular coversites. Some tortoises may not be able to get out when they wish and all may not fit inside. If this happens, you should prepare another coversite with the same characteristics of the preferred site--length, facing direction of the opening--and see that the overflow accepts it. The important rule here is, "BE WATCHFUL", SEE that each tortoise has access to the type of shelter that he chooses. There may be burrows that you have prepared that no tortoise uses. Try altering the length, possibly a caliche layer prevents the tortoise from digging farther. The coversite may not be snug enough, or be too hot or too cool in summer, or damp.

If your tortoise persists in using a place that causes problems for you or may be unhealthful for him, such a place that is watered or is in the way of human activities, the tortoise is "trying to tell you something" about his needs. Look at the features of the site that may make it attractive to the tortoise, such as time of day that the sun shines there or it is shady. Try to find another place with the same features, prepare it for the tortoise and then block the tortoise's access to the trouble spot.

Why all this attention to shelters and basking areas? In order for the tortoise to function properly and remain healthy it must be allowed to move in and out of various temperature situations in order to regulate its body temperature. Unlike birds and mammals, tortoises do not have an automatic "thermostat ". Although tortoises are adapted to desert living their preferred body temperature is lower than that of human beings. It is the tortoises' ability and inclination to dig burrows that protect the tortoises from death due to overheating or freezing. Because soils in most yards have been changed due to compaction and watering, the tortoise may need help in burrowing.

Crowding is a matter of sexes and sizes as much as it is a matter of numbers.

In captivity, stress from crowding is the result of the sexes and sizes of tortoises as much as it is the number of tortoises. Males raised together or males without females may get along BUT compatible males will usually start to fight when a female is added to the group.

(over)

Fighting involves chasing, shoving, biting, and flipping of one tortoise by the other. This may occur several times a day for several days. Males may than settle down to a seemingly peaceful coexistance BUT serious problems may be present. BE WATCHFUL. The loser may thereafter try to avoid the dominant male, may run away from him each time he sees him. Eventually, the "underdog" may not come out to feed or bask. He may refuse to eat, even when you feed him apart from the dominant male. He may develop a runny nose, become sluggish and may die within a few weeks without having engaged in any more fighting.

Surprisingly, when a new male is introduced to a group, the long-time dominant male or recent dominant male is not necessarily the victor of a "fight". The newcomer may become the dominant male. If you now have only males, or compatible adults of both sexes, you may be disturbing the well being of all adults by introducing an adult of either sex UNLESS you are adding to an all-female group.

Another sign of crowding is persistent fence-pacing. When a new tortoise is introduced, it tends to check the boundaries of the yard and may attempt to climb out. This behavior usually subsides within a few days if there is adequate shelter and food. If restlessness continues or the tortoise becomes withdrawn, refuses to eat, or continues to fight, these are signs of stress and should be heeded. The males involved should be separated permanently.

Another cause of crowding is from hatchlings. Not only will each hatchling need a burrow of its own but reproduction may be so successful each year that you run out of room. New homes must be found for the young of the year. The apparent ease that you may have found in finding new homes for hatchlings is not necessarily an indication of real success. Despite the natural appeal of hatchlings and the seemingly convenient size, hatchlings are not easy to raise and are not the pet of choice for a child! The death rate is high.

In Las Vegas, the trend has been for the number of tortoises needing good homes to exceed the number of persons able to provide continuing, responsible care. Tortoises live about as long as the average person. The stress and death mentioned above have been observed and the runny nose condition studied by several veterinarians. Crowding and captive environments are a major predisposing factor. Uncontrolled reproduction can be a part of this problem. Rather than disrupt the season-long sexual interaction among adults, we suggest that captive populations be controlled by destroying eggs when appropriate. The female shows no interest in her nest after the egg laying and nest covering is finished.

Unlike long-time captives, hatchlings have all their wild characteristics and could "earn their living" in suitable desert; HOWEVER, the areas of tortoise habitat studied to date, indicate by their condition that they can support fewer tortoises now than they once did. To release the independent hatchlings would create added competition among all tortoises present and would further reduce the capacity of the desert to support tortoises. Some tortoises would probably die unnecessarily before the wild population stabilized itself at the number that the desert area could support. Until we can protect the desert from further degradation (due to off-road vehicles and dumping, for example) it would be pointless and inhumane to try to increase the size of wild populations by releasing tortoises of any age.

FOODS THAT ARE RECOMMENDED and FOODS THAT ARE NOT and REASONS FOR THE RECOMMENDATIONS

Most deficiencies in tortoises are from diets LOW in VITAMIN A, CALCIUM, AND PROTEIN. The challenge is to provide these nutrients, plus B COMPLEX, without giving excessive sodium, or creating an INVERSE RATIO of CALCIUM to PHOSPHORUS, that is, more phosphorus than calcium. The tortoises' diet in the wild has a calcium to phosphorus ratio of 6 to 1 (6:1)!!

SODIUM: Most fresh fruits and vegetables contain only 1 to 10 milligrams of sodium to 100 grams of the food. Canned vegetables average 236 mg per 100 grams!! AVOID CANNED VEGETABLES. Also, AVOID creamed cottage cheese, breads, and celery.

Spinach has valuable nutrients but also contains OXALIC ACID. Oxalic acid binds calcium making it UNAVAILABLE to the system. Young leaves contain less oxalic acid than older leaves.

" PRIMATE DIET" (monkey chow) is the preferred protein supplement because it is well balanced in all nutrients and unlike other high-protein foods Primate Diet has more calcium than phosphorus (desirable).

IN THE TABLE BELOW FOODS MARKED WITH " X " are relatively high in the nutrients listed. This makes some of the foods DESIRABLE and others, UNDESIRABLE. Some of the protein sources are high in sodium and/or have an undesirable calcium to phosphorus ratio.
These should be avoided or restricted. COMPARE THE VALUES FOR " PRIMATE DIET" WITH OTHER PROTEIN SOURCES.

Food 100-g amounts	DEFINITELY DESIRABLE				UNDESIRABLE OR CONDITIONAL	
	Vit.A more than 5,000 IU	B Compl.3mg or more per 100 grams	Protein more than 3 mg/100 g	Cal.:Phos. ratio at least 2:1	Cal.:Phos. ratio - other	Sodium more than 100 mg/100 g
Broccoli	X	X	X	X		
Dandelion greens	X			X		
Parsley	X		X	X		
Watercress	X			X		
Carrots	X	X				
Collards	X		X	X		
Kale	X		X			
Mustard greens	X		X	X		
Beet greens	X	X				X
Swiss chard	X			X		
Spinach	X	X	X	X		
Alfalfa hay	X		X	X		
Clover	X		X	X		
Bluegrass lawn	X					
Avocado		X				
Cauliflower		X				
Peas		X	X		1:4	
Wheat germ		X	X		1:16	
Cottage cheese,						
creamed (2%)			X			X (406 mg)
dry			X		1:5	(13 mg)
"PRIMATE DIET"	X	X	X	1:0.8		

COMPARISON OF NUTRIENT VALUES IN FOODS (raw unless otherwise stated)
This information will be easier to understand if read in connection with the section on FOOD in the pamphlet, "How to Adopt and Care for Desert Tortoises".

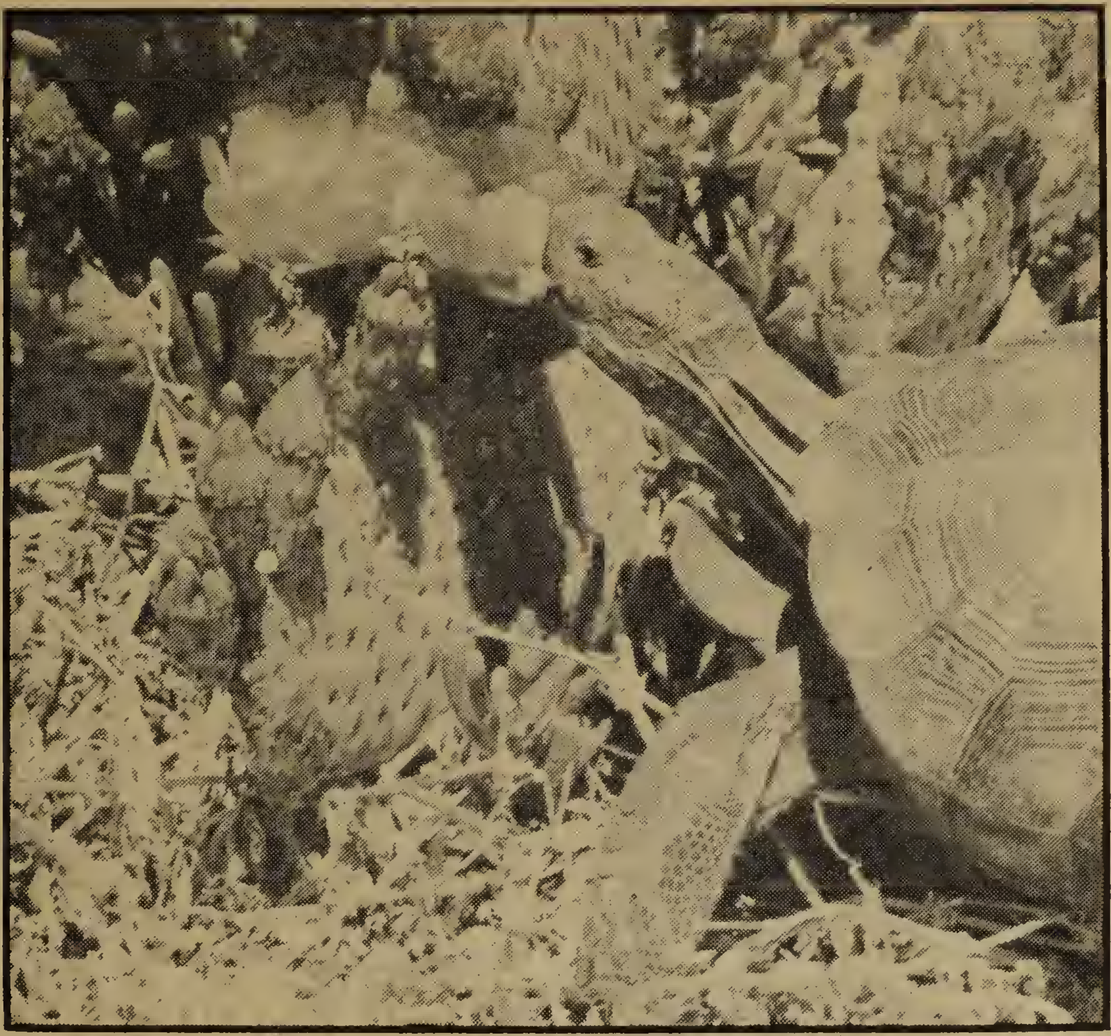
Food (in 100-gram amounts)	Protein (grams)	Vitamin A (IU)	B Complex (mg)	Calcium (mg)	Phosphorus (mg)	Sodiu (mg)
Broccoli (5 in. stalk)	3.6	2,500*	11.4	103	78	16
Dandelion greens	2.7	14,000	—	187	66	76
Watercress	2.3	4,988	2.0	154	55	18
Spinach	3.2	8,028	8.0	92	50	71
Parsley	3.7	8,670	2.6	207	65	45
Mustard greens	3.0	7,000	1.3	183	50	32
Carrots	1.1	11,000	4.2	37	36	47
Swiss chard	2.4	6,500	.9	88	39	147
Collards	3.5	6,500	2.3	203	63	trace
Kale	4.2	8,900	3.0	61	75	47
Beet greens	2.2	6,100	3.9	119	40	130
Cauliflower	2.7	60	3.7	25	56	13
Alfalfa sprouts	5.1	—	2.0	28	—	—
Mung bean sprouts	4.0	20	1.1	20	67	5
Alfalfa hay **	9-15.5	589-10,800	—	1290	210	50
Alfalfa fresh	4.4	5,640	2.7	380	70	—
Clover	3.5	8,960	—	290	60	—
Bermuda grass hay	4.0	—	—	370	190	—
Bluegrass lawn	2.4	7,930	5.6	100	90	trace
Peas	6.4	651	3.6	27	118	[illegible]
Stringbeans	1.9	600	1.8	52	46	7
Lentils (cooked)	7.8	40	1.4	25	119	—
Zucchini	1.0	484	1.8	28	29	1
Cabbage	1.3	129	2.4	49	29	14
Tomato	1.1	945	2.5	14	28	3
Avocado	2.1	290	4.5	6	18	1
Apple	.2	90	.3	7	10	1
Banana	1.1	162	.6	7	23	1
Cantaloupe	.7	3,400	1.0	14	16	12
Apricot	1.0	2,601	.9	16	23	—
Tofu	7.8	—	.2	100	176	7
Wheat germ (raw)	26.6	0	5.5	72	1180	3
Egg (1, med.hard cooked)	6.5	590	1.0	27	103	61
Cottage cheese (dry type)	17.0	30	3.5	20	104	—
"PRIMATE DIET" (monkey chow)	20.0	***	***	500	400	—
Romaine lettuce	1.3	450	1.2	27	58	10
Iceberg lettuce	1.0	325	1.1	48	18	10
Celery	1.1	320	1.4	47	34	126

* Average. Leaves,16,000; flower heads, 3,000; stems, 400 IU
** Early bloom and late bloom yield different values,thus the range shown.
*** Nutrient is present in balanced amounts.
— Values not given in the references: Nutritional Almanac, Revised edition. Nutrition Search, Inc. McGraw-Hill, 1979. Nutrient Requirements of Domestic Animals. 2nd ed. Nat. Academy of Sciences, 1977.

BLB 1987

TORT-Group
The Organization For The Protection of Nevada's Resident Tortoises, Inc.

Presents: HOW TO ADOPT and CARE FOR DESERT TORTOISES



The Desert Tortoise, Gopherus agassizii. Photos by Norma Engberg

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THE LAW & THE DESERT TORTOISE

To paraphrase the new state law: Desert tortoises in urban areas of Clark Co. may be possessed legally without a special permit. The intent is to allow those persons who now have domesticated tortoises — dependent upon custodial care — to keep them and to allow persons to adopt from the many homeless domesticated tortoises available. These tortoises are not to be released to undeveloped desert. The free-living tortoise continues to be protected under the law — not to be collected or disturbed. No desert tortoise, wild or domesticated, its eggs or remains are to be bought or sold without special permit.

The Nevada Dept. of Wildlife is responsible for the wild desert tortoise. Poaching or abuse of the wild tortoise should be reported to them. Abuse or neglect of the domesticated tortoise should be reported to the Animal Shelter.

HOW TORT-Group HELPS

By promoting adoption of domesticated tortoises, we help to reduce the poaching of wild tortoises. TORT-Group also is concerned with the quality of life of domesticated tortoises. **Responsible care** is our watchword. Much of our efforts involve giving free information and personalized service to those who have tortoises and those who want to adopt one. **There is no charge for adopting a tortoise.**

The welfare of the tortoise is best served when the prospective tortoise owner prepares properly for the new tortoise, even if that person already has a tortoise. By reading the Care Sheet carefully, you can find out what is involved in responsible care and prepare in advance. Many persons realize after hastily accepting a tortoise that it is not the right pet for their family.

In preparing for a new tortoise, you may find it helpful if a member of our Adoption Committee visits your yard to help you plan. We ask to visit your final set-up because adoption should wait until you and your yard are ready for the tortoise. For example: **Many tortoises are found wandering in traffic. Most are obviously pets that probably escaped from improperly secured yards, such as through an open gate. A tortoise can pass through an open gateway and be out of sight in a few minutes; whereas, designing and installing a step-over barrier across the gate opening may take several hours. The need to prepare in advance is real.**

Box turtles, Texas tortoises, and other turtles and tortoises have been among those donated to us or about which inquiries have been made by persons thinking that they have a desert tortoise. Care differs among them and inappropriate care constitutes abuse.

Most pet tortoises will be healthier and more comfortable after their owners have used our recommendations about food and shelter.

A WORD TO THE WISE

Do not expect a child to assume full responsibility for the care of a tortoise, *especially for very small tortoises.* Small tortoises are very appealing *but* are more difficult to care for than large tortoises. They should *not* be kept in an aquarium or indoors. A tortoise is not the pet of choice for the typical child; it is more suited to adults. The well being of a small tortoise in a home with children may depend upon constant watchfulness and reminding by the parent that the child take care of the tortoise, on one hand, and stop playing with it, on the other.

Unless special arrangements are made, the proper conditions for a tortoise are not available in the classroom. Traveling to strange places and being handled almost constantly are not good situations for most tortoises. Tortoises seem to thrive best on a *routine* in *familiar surroundings* and should not be taken along when a child visits friends.

ELIMINATE HAZARDS IN YOUR YARD

Make your yard escape-proof before the tortoise arrives. Some type of fencing is necessary — **never tether a tortoise!** If you have board or wire fencing, you will need to sink boards or wire mesh several inches below ground level to discourage tunneling out.

Where a tortoise *can see through* the base of the fencing, the tortoise *will try to get through.* At most, this may lead to injury and death; at least, to constant fence-pacing and frustration. A permanent, secure, continuous 18-14 inch baseboard that the tortoise cannot see through or climb up on usually eliminates this major hazard.

In addition to latching the gate when not in use, you should install a permanent, secure, 18-inch high barrier across the base of the gate opening. This will prevent escapes during your use of the gateway or if the gate is accidentally left ajar.

If you have never had a tortoise you will be surprised by the trouble a tortoise can get into, and, unlike cats and dogs, the tortoise does not whine, yelp, or howl when hurt or in a life-threatening situation.

A number of tortoise traps may be present in your yard. During the tortoise's wanderings or search for water, your tortoise may eventually fall into your swimming pool and drown.

Tortoises seem to enjoy climbing and may become entangled or tipped over. Trouble spots include steps, piles of wood, and odds-and-ends, parked cycles and power equipment, especially when stored on a concrete slab. A tortoise that falls on its back and is unable to right itself (very likely on bare soil or concrete) can die of overheating before you find it. Also, because the lungs lie just under the upper shell, the weight of the other organs on the lungs can suffocate the tortoise.

Another danger is the family dog. With a tortoise, the dog may be curious, jealous, aggressive, or playful. Any of these responses may lead to the death of the tortoise. A dog can severely injure or kill a large tortoise in a few minutes.

One cannot predict how *your* dog will respond if it has never shared the yard with a tortoise. You should be prepared to watch the two of them almost constantly u[illegible] you know whether or not the dog can be trusted.

Any kind of harrassment can be injurious or stressful for the tortoise. For this reason **a tortoise is not recommended for households in which the behavior of pets or normal manipulative behavior of children cannot be directed away from the tortoise.** A child should be willing to enjoy watching how the tortoise spends its day, rather than having to carry the tortoise about. The tortoise's shell is breakable if dropped. (If it is necessary to move a tortoise, hold it in the same position as it stands and support the feet if they are not pulled into the shell.)

TEMPERATURE REGULATION

The desert tortoise, like other reptiles, regulates its temperature by seeking temperature situations in the environment that provide the desired effects. It will bask in the sun to warm its body — necessary to support activity such as foraging and proper digestion — then, it will move to shade or to a burrow to prevent overheating. **One of the tortoise's major adaptations to living in the desert is not an ability to tolerate extreme heat. It is the tortoise's ability to dig a burrow and get out of the heat.** The tortoise's preferred body temperature is in the mid 80's. That is considerably cooler than our 98.6 degrees. *To lose heat, the tortoise does not sweat. Instead, it must go to a place where the temperature is cooler than the tortoise's body. In summer, this may mean cooler than any above-ground shade.*

Never confine a tortoise to an area too small to provide the range of temperatures it needs to warm up and cool off, but sunlight should be available for most of the d[illegible] Remember, areas in your yard that receive sunlight [illegible] change during the year.

Never cover a tortoise's shell with paint. The shell is very sensitive. The tortoise's body temperature changes as heat is gained and lost through the skin *and shell.* Covering or changing the color disrupts this vital natural process. Furthermore, it is in the seams between the plates that shell growth occurs. Coverings can deform the shell and toxic substances can be absorbed.

It is nearly impossible to provide an adequate indoor situation that has the needed range of temperatures and humidity. Room temperatures are not adequate. Indoor heating and cooling systems can be very harmful.

If you try to care for a tortoise indoors you are risking its health and life, particularly if the tortoise is young. Direct sunlight, so important to a young tortoise, cannot reach it through ordinary glass. Ultraviolet lamps are dangerous and setting the tortoise outside for a few minutes or hours each day has resulted in death from overheating or other loss.

The desert tortoise is native to our local desert. It is logical to take advantage of the natural, available climate. Provide your tortoise with adequate outdoor habitat and your tortoise's behavior and body functions will respond naturally to the daily and seasonal changes in temperature and day-length.

SHELTER

Shelter, particularly the underground burrow, is a vital part of the tortoise's daily life. The burrow functions as a buffer between the tortoise and the extreme desert temperature and helps the tortoise conserve vital moisture. A tortoise must have access to adequate shelter.

A pet tortoise may or may not attempt to dig a burrow. Indeed, because of the caliche layers (hard pan) and compaction in most yards, the tortoise may not be able to dig to an adequate depth.

In most yards, places the tortoises may choose to dig are not going to be safe or healthy for the tortoise — such where the soil is damp or under a wood pile that may collapse. Expect to pick a proper place for a burrow and start it there. **Soil in the burrow must remain dry year-round.** Dampness is a major factor predisposing tortoises to respiratory problems that are almost impossible to cure and often result in death.

The opening of the burrow should be at least 5 feet from where you water (lawn, trees, flowers, shrubs). The sides and end of the burrow, at least 10 feet away. Otherwise moisture will eventually seep down and dampen the inside of the burrow. The burrow should not be under the eaves, by a gutter down-spout, or anywhere that water puddles.

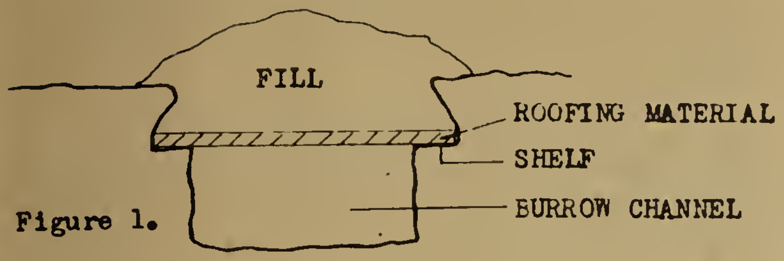


Figure 1.

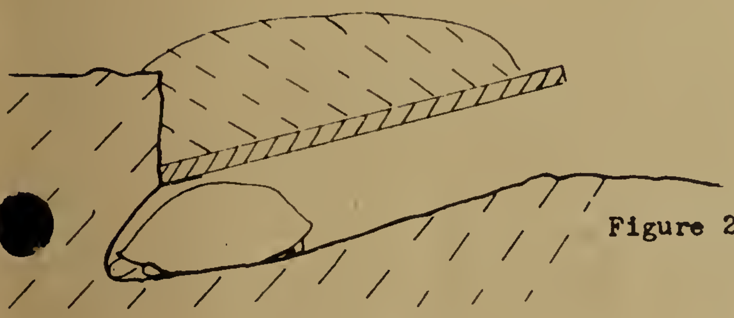


Figure 2.

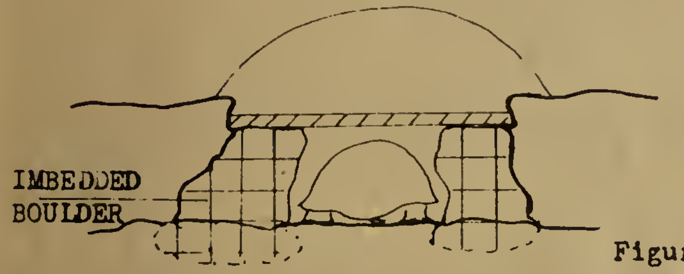


Figure 3.

Burrows should **not** extend under your property fence to where you have no control over watering, digging dogs, etc. **The burrow should extend in toward your property.** This way you have control over the roof as your tortoise lengthens the burrow (expect him to lengthen it). Do not plant anything needing irrigation on or within 10 feet of the burrow. A properly dug burrow in the open will not become flooded or damp from our rainfall it if falls naturally on to the burrow.

After you have found the dry setting for the burrow, dig a trench that is *just wide enough for the tortoise to turn around.* Slope the floor downward gradually at about 15 degrees. At 6 feet, a good starter-length for an adult, the trench at the end should be 2 feet below the surface. If the trench soil is damp, allow all the moisture to surface and evaporate before roofing. As the surface dries, turn the soil with a shovel to expose and check the soil below. Drying may require several weeks.

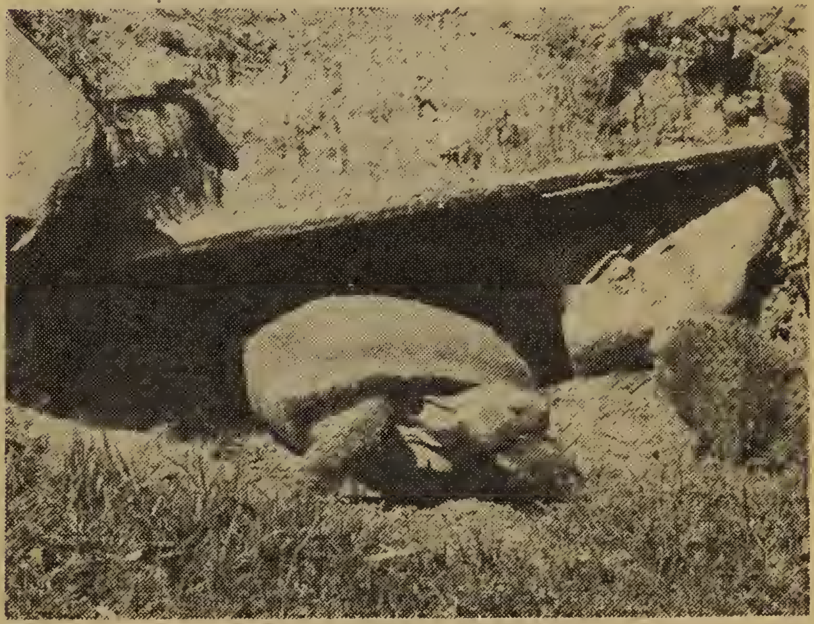
Now, carve a shelf on which to lay roofing material, such as 3/4 inch plywood that is firm enough to support the soil that you removed *without sagging.* (FIG. 1) The roofing material should extend about 6 inches beyond both ends and both sides of the burrow channel (trench). The shelf must slope downward, parallel to the entire floor. (FIG. 2)

Make the shelf so that the roofing material fits snuggly — no spaces for water to trickle down. When in place, the roof should be 2-3 inches higher than the tortoise's shell so the tortoise can just scoot in or out, not walk upright all the way. This snug fit is important. If the roof is a little too low, the tortoise can dig out the floor; but if the roof is too high — the channel too drafty — the tortoise may not accept the burrow or be able to make it right.

When the channel is complete and the roofing material in place, pile and pack the excavated soil on top of the roofing. Mound the surface to prevent puddling from any rain.

Every tortoise should have a burrow that he can enter and leave at will; where there is at least 9-15 inches of soil above the shell for at least 2-3 feet of the burrow's length and at least 3 inches of soil above the opening. Tortoises may share burrows but cannot derive adequate protection from heat or cold if he cannot get in far enough because another tortoise blocks the channel. Throughout the year, a wild tortoise uses a dozen or more burrows of *various lengths.* Most burrows are used by one tortoise at a time. Where there are very large cavities in wash banks several tortoises may share, particularly during winter. Long, large burrows warm up very slowly so in the spring, tortoises emerging from winter dormancy often move to shorter burrows (less than 4 feet long). Here the tortoise and the burrow warm up faster. **To provide different temperature options during the year, dig a second burrow. If you have more than one tortoise of the same size, this may be important to prevent crowding and conflict.**

If you must build an above-ground "burrow," the roof and walls should be 18-24 inches thick or you will have created a summer "hot-box."



Adult tortoise at burrow opening.

Small tortoises should have proportionately smaller burrows. It is important that the larger tortoises not be able to enlarge a small tortoise's burrow. They are attracted to them and may try. To prevent this, imbed a boulder on each side of the opening of each juvenile's burrow. Boulders must be too heavy for the larger tortoises to dislodge. (FIG. 3)

Learn how to check the inside of the burrows for signs of dampness. Watch for damp soil smudged or caked on the tortoise. To see inside the burrow use a flashlight or even better, direct reflected sunlight into the burrow with a mirror.

If the inside becomes damp at any time of year: 1) Provide a dry burrow or an insulated substitute for the tortoise. Move the tortoise to it if hibernating. Do not let the tortoise use a damp burrow. 2) Remove the burrow's roof to expose the inside and the fill soil to outside air and sunshine (even in winter). 3) Cover both well only when it rains (a plastic drop cloth is inexpensive waterproofing). Even in mid-summer the interior of a damp burrow may not dry out unless fully exposed. 4) Consider the reasons that the burrow became damp and plan to make changes.

WINTER DORMANCY

During the period of winter dormancy or torpor ("hibernation"), most indoor temperatures are too high — 65 degrees or above — too warm to slow the metabolism effectively and conserve fat and moisture when the tortoise is not eating. By spring, such a tortoise may be debilitated and dehydrated. Temperatures 40 degrees to 55 degrees are needed.

Young tortoises, even hatchlings, hibernate. The hatchling has enough yolk material left so that even if there has been very little to eat in the fall the hatchling can survive hibernation the very first winter, that is, he is equipped for life on his own, even to digging his own burrow. In an outdoor burrow there is not the risk of dehydration, a very real threat to hatchlings hibernating indoors.

If you must provide a substitution for the outdoor burrow we suggest an unheated room in your home. Secure a reliable thermometer to place next to the tortoise. Make a "garage-burrow" out of cardboard boxes. The "burrow" should be at least twice as long as the tortoise (important to reduce drafts), 2-3 inches higher than the shell. The box width and opening (door) just wide enough for the tortoise to turn around. *The opening must be at one end*to allow the tortoise to go in and out freely. Line the "burrow" floor with 15-20 sheets of newspaper.

Where you but the box is very important: On the floor, where it will be draft-free, temperature 40-55 degrees F, where you can check the tortoise and temperature, often, easily, and without disturbing the tortoise. The tortoise will probably choose to rest facing in at the far end of the "burrow." If you loosely drape the opening with a towel this will reduce drafts and dehydration. If the tortoise comes out the fallen towel will "tell you."

The best place for a tortoise to pass the winter is in a natural underground burrow. A burrow that you and/or your tortoise dug for protection against summer heat, one that has remained dry, may be what the tortoise chooses to use for winter. Substitute situations are likely to be too warm to too cold; too damp or too dry.

The hazards of substitutes are many, such as: The average storage shed is not insulated and becomes too cold in winter. In late winter (too early for the tortoise to become active) it may become too warm. Even in a garage, temperatures may be too warm or cold. If the tortoise is free to walk about in either place it may become critically caught among stored items or come to rest in the path of vehicles.

Another hazard is the cardboard box. If you put the tortoise in a 4-sided box the tortoise may attempt to climb out, fall on its back and be unable to right itself. If this happens out of your sight or hearing, the tortoise will die. If such a box is kept several feet off the floor the tortoise may fall and injure itself. Tortoises slow down gradually in the fall, may wake up during the winter, and wake up gradually in the spring. Therefore, the accidents may happen at any time.

The outdoor burrow is preferred. There are physiological adjustments that occur over a period of weeks prior to dormancy in the fall and prior to spring activity. In September, tortoises eat less and less, spending more and more time in the winter burrow, before the final dormant period begins. In March, when dormancy ends, the tortoise basks with increasing frequency; yet, no other activity may occur for weeks. These fall and spr "schedules" vary with the individual from year to ye they seem to be partly a function of day-lengths and temperatures, and partly a function of the tortoise's internal (biological) "clock." *Only in an outdoor situation can their fall and spring adjustment periods proceed normally. In the fall, the tortoise may not be ready for the artificial confinement that you impose and in the spring, you cannot predict with certainty the tortoise's schedule; hence, we recommend that you provide adequate outdoor burrows for year-round use.*

FOOD AND FEEDING

It is difficult to duplicate the vegetarian diet of a free-living tortoise; therefore, special attention must be paid to ensure proper nutrition, especially for young tortoises. Vitamin A, calcium, and protein deficiencies seem to be most common.

Although no one plant species can be considered a complete food, alfalfa probably comes closest. We recommend that you plant a patch of alfalfa (it's a perennial) and foster the growth of dandelions. Transplant them from neighbors and local businesses if no toxic sprays have been used. Lawn grasses are only a fair source of nutrients if only blades — no seed heads — are available.

Ornamentals that are accepted by the tortoise include rose petals, grape leaves, pyracantha berries and leaves, elm and mulberry leaves (green and dry), hibiscus, dichondra, cactus flowers and fruit, and the pads of some prickly pears. As for poisonous plants that you may be growing such as oleander, daffodils, tom plants, and rhubarb, *be watchful.* Tortoises seems know what is edible among the wild plants but in your yard, may die while learning. Do not use snail bait, weed or pest sprays, or systemic poisons.

The tortoise will eagerly accept most substitute — "people" — foods but *tends to eat lettuce to the exclusion of other foods.* Lettuce is so low in nutrients that a tortoise could not get what it needs no matter how much lettuce he eats. Lettuce, even Romain, is mostly water and only temporarily satisfies the tortoise. A lettuce-fed tortoise is a hungry tortoise that may run to you out of deep hunger. Actually, there is no need to offer any lettuce to a tortoise, especially a young one. There is a great deal of water even in the more nutritious foods; therefore, the part of food that is not water should be the best we can offer. Veterinarians report that as a result of lettuce diets, deficiencies are common. It may take a long time for deficiencies to become obvious to you; by then, correction may not be possible.

Excellent sources of vitamin A, calcium, and protein include **broccoli** (stems, leaves, and heads), **parsley, collards, watercress, kale,** and **mustard greens.** Other good sources of vitamin A but not as good as the dark green leafy vegetables are carrots, and "winter" squashes like banana squash. Much less nutritious are zucchini, and other summer squashes. Sources of plant protein are **alfalfa and bean sprouts,** and **peas** (fresh or frozen). Among the low potency foods are tomato and the sweet fruits.

Foods to *avoid* include those high in sodium, such as breads, canned vegetables, and creamed cottage cheese. *Foods with virtually no merit* include celery, which is also stringy, cucumber, watermelon, cabbage, and of course all types of lettuce.

To supplement what your tortoise forages from your yard we recommend that you prepare a shredded salad. ce your tortoise accepts this salad almost any items t you add to it will be eaten, even foods that the tortoise has never accepted when offered alone. Shredding a variety of nutritious foods and mixing them together is the secret to a well balanced diet.

Use a shredder for hard foods such as broccoli stems, carrots, and banana squash. Because the tortoise does not chew its food, merely bites and swallows, chunks of the above foods can cause choking, difficulty in swallowing, or injuries to the cutting edges of the beak. Foods the consistency of zucchini *can* be eaten safely without shredding but should be shredded nevertheless. The purpose of shredding these softer foods, and leafy ones, is to allow thorough mixing so that favorites cannot be selected out and unwanted foods avoided. For leafy foods, use a knife and a cutting board, break apart broccoli heads.

Center the salad around **broccoli, collards, and parsley,** add some **carrot** or **banana squash** (the yellow is very attractive to tortoises), and a few **sprouts** or **peas.** Any tomato, sweet fruit, or avocado you add should be in much smaller quantities than the items above and are not needed with every meal. Summer squash is more or less a filler and provides variety *(variety* increases the tortoise's chances of getting vital trace elements). See TORT-Group's Information Sheet No. 4: Comparison of Nutrient Values in Foods. Now add **dry alfalfa** which has 4-10 times the nutrient value of an equal weight of fresh alfalfa. If you have access to alfalfa hay, sift out the stems and add some leaves to the salad. The leaves will stick to the moist mixture. A readily available rce of dry alfalfa is ***commercial rabbit chow.** ore adding the pellets to the salad, use just enough water to soften them completely. Add them to the salad and mix in well. Start with a small amount of alfalfa, increasing to as much as the tortoise will accept.

In the wild the tortoise secures the protein it needs from vegetation. In your yard supplemental sources are important, especially for young tortoises. We recommend ***Primate Diet** a particularly well balanced protein source. Depending upon the size of the tortoise, allow 1 to 3 biscuits per tortoise about twice a week. Soften the biscuits in water just before using, crumble into fine pieces and mix well with the salad. Softened puppy chow is a protein source but not the one of choice.

Other supplements: Calcium and vitamin A are recommended, particularly for young tortoises and reproducing females. The diet of the wild tortoise has a calcium to phosphorus ratio of about 6:1. The best selection of salad vegetables and supplemental protein yields about a 1:1 ratio. By adding powdered bone meal or other calcium-plus-phosphorus preparations you may increase the ratio to 2:1. Attaining the proper ratio is as important as supplying adequate totals of nutrients; therefore, to increase the proportion of calcium you must add a *calcium-only* source, such as **calcium gluconate or *calcium lactate.* A pinch per day per tortoise may be enough.

Vitamin A preparations (available from veterinarians) can be added to the salad. These include Nutriderm, Nutrical, Linatone, and B.V.M.O.

Mix enough salad for only 1 or 2 days. Grass is an excellent surface on which to serve prepared mixtures. Place a "handful" of food in front of each tortoise after it has basked and/or becomes active in the morning, and again when the tortoise is active in the afternoon. Do not leave uneaten food out. It spoils quickly and attracts insects. A tortoise may eat several helpings at a meal; however, make sure the tortoise also does some searching and grazing on its own each day. Then you will know that the tortoise *can* find and *will* eat the growing food that you have provided. This is very important for the tortoise that is ready to eat when you are not at home, particularly if you have small tortoises.

If your tortoise refuses the nutritious salad after you have tried on three separate occasions in succession, do this: make a shredded salad of the foods that the tortoise has been eating, to this add a small amount of shredded nutritious foods. Over a period of days or weeks change the mixture gradually by decreasing the proportion of "poor" foods while increasing the proportion of nutritious foods. Always offer in shredded form, mixed well. Be patient, don't give in, and proceed as fast as the tortoise will allow, eventually, your tortoise will accept what is best for him.

Water

Water for drinking and soaking should be provided in a shallow, shaded container. This should be large enough to permit the tortoise to sit in it and the sides low enough for the tortoise to climb in and out easily. A 12" x 2" pottery dish, such as that used under a flower pot, should be *sunken to ground level.* This not only allows access but permits the tortoise to lower its head into the water while standing at the edge of the dish, important because of the tortoise's rigid underside and projecting gular horn. To drink, the tortoise typically immerses its mouth *and nose* and swallows repeatedly for 5-10 minutes.

To keep mud out of the dish use flat rocks, bricks, or large wood chips to surface the soil from the level of the lip of the dish to about a foot out in all directions.

Some tortoises prefer to drink from puddles left by your sprinklers. Even if you never see the tortoise drink or if it drinks only when it rains, you should still provide a suitable container, its water changed daily. If your tortoise has been a lettuce-eater you may see a change in the drinking habits once he's off lettuce.

Tortoises often urinate after drinking or eating. Like birds, tortoises pass insoluble, white salts in the urine. From the tortoise, these may be white to lavender and may appear gritty or like curdled milk. Flush any urine from the drinking dish immediately and "hose-in" any deposited on the lawn where tortoises may feed.

Remember, permanent shade for the water dish is important. *Water that is shallow enough to be safe will become too hot to touch if not shaded.*

REPRODUCTION

Size rather than age determines reproductive readiness. Females are usually ready when the length of the carapace (upper shell) is 8 inches. How many years it takes for a tortoise to reach this size depends upon how well it has eaten. A wild tortoise may be 15-20 years before it breeds.

Sexual differences become definite when the tortoise is about 7 inches. Males begin to develop a concave plastron (lower shell). A female's plastron remains almost flat. Courtship and mating may occur any time the tortoises are active. Typically, the male bobs his head at the female, nips at her front legs and front edges of her shell. This usually makes her stop and pull in her head. The male then moves to her rear and mounts.

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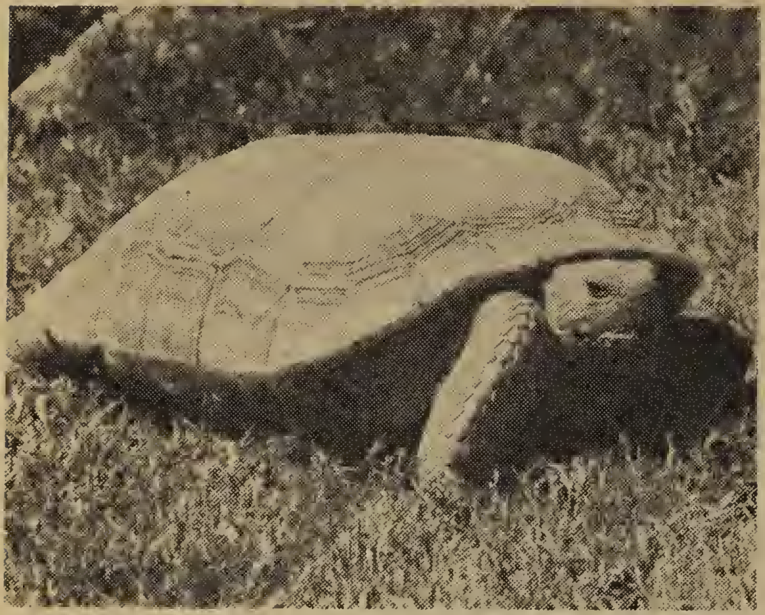
*Package sizes available commercially may be too large for most of you. At TORT-Group meetings small packages can be purchased.

Eggs are laid from early May to early July. Two clutches may be laid several weeks apart. The female digs a nest — and a shoe-shaped hole about 4 inches deep — with her hind legs. The nest is often just inside the burrow opening but may be anywhere that the soil is not too firm. The usual clutch has 4-8 eggs of ping-pong ball size. After laying the eggs she covers them, using her hind legs and shows no further interest in the nest or the subsequent hatchlings. The nesting procedure takes several hours.



If the nest is where it will remain dry and receive sunlight for part of each day the eggs may be left to hatch naturally (If you are interested in rearing hatchlings). If the nest is in a damp, mostly shaded place, move the eggs to a dry, sunny "nest." An indoor incubator can be made from a cardboard box but there are important features that you must provide (call us). Hatching occurs between 80 and 120 days depending upon temperature. There is a good chance that if your female lays eggs you won't know about it until you find hatchlings in late August or September.

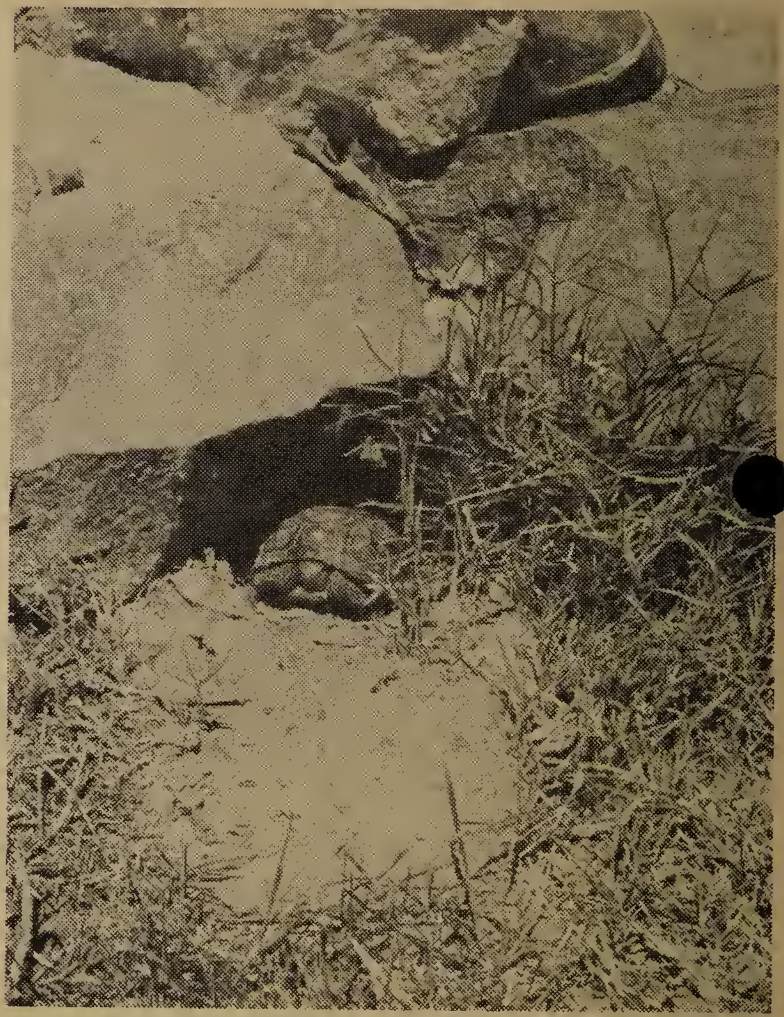
HATCHLINGS

After pipping (cracking the egg shell) the hatchling usually remains at rest below the soil surface in the lower part of the egg shell for about 2 days and should not be disturbed. During this time the yolk sac that protrudes from the lower shell shrinks and dries within the safety of the nest. By the time that you first find the hatchling walking about, there is only a slightly raised "belly-button" where the yolk sac was. The almost boneless shell is very soft and will remain so for several years.

Since hatchlings wander widely, you must re-evaluate the suitability of your yard and make the necessary changes *before hatching occurs.* What is hazardous to adults is also hazardous to small tortoises, but you must think of the hazards relative to the smaller size involved. Consider avenues of escape. Vertical drops, taller than the hatchling is long, may cause tipping over, and small tortoises do not right themselves easily. Eliminate places where access may be easy on one side but drop steeply on the other such as tree wells and grass edges. The p[illegible]son who cuts the lawn must be willing to watch out [illegible] hatchlings, they may be anywhere. A hatchling can be crushed as it rests in the path of traffic to parking and storage areas.

Another potential hazard is the adult's water dish. A few well placed flat rocks will provide a safe way out if the hatchling happens to fall in. Youngsters seldom use the large dish but may fall in accidentally.

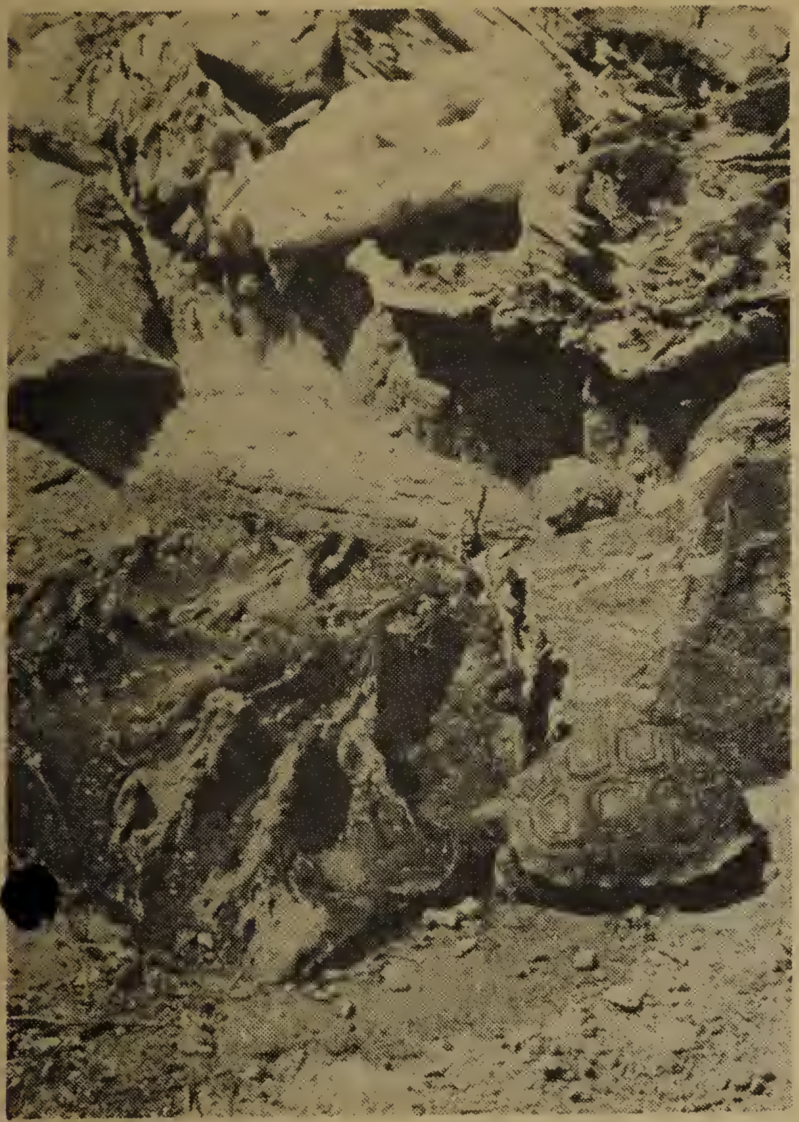
Reconsider the hazards from the family cat or dog, and the age and temperament of the children. A dog that may not bother a large tortoise may eat hatchlings or play them to death. Cats may cause trouble by turning babies over during play. *Be watchful.* Hatchlings are not sociable, they are very shy and defensive. They can learn from gentle handling that you are not to be feared but children tend to want to *play* with the babies; this should be avoided. **Small tortoises warm up faster than large tortoises and need frequent cooling off periods, they must be given the opportunity to do this, only they know when it is time to leave the sunlight and seek shade. As little as 15 additional minutes of forced exposure to the hot sun may cause death from overheating.**



This juvenile has excavated under an overhanging boulder that is wide enough not to settle on the tortoise as he tunnels.

A small tortoise may spend many hours each day in the alfalfa patch. There the baby can remain partially hidden (secure) yet close to patches of sun for basking, shade for cooling, and food.

The same consideration for dryness given to sites for larger tortoises' burrows should be given to hatchlings' burrows. A hatchling can dig its own burrow if proper soil is available. If you start a burrow for him follow the pattern for larger tortoises — make the opening as wide as the tortoise is long. Juveniles usually do not share their burrows with other tortoises. If a hatchling wanders into an adult's burrow there is always the risk of being accidentally squashed; however, it will stay out of large burrows if there are adequate places to dig or burrows of the right size available.



Depressions in the lava rock create shallow puddles from which juveniles can drink naturally and safely.

Because of caliche or compaction you may need to break up the soil and add sand in the area or places you provide for the hatchling or small juvenile. Test the dry soil consistency. It should allow the youngster to dig easily yet the tunnel must hold its shape and not collapse. You might arrange an embankment or mound of soil, large enough for the hatchling to dig a burrow that is 5 to 10 times its shell length. Start the burrow under the overhang of a boulder at least 10 inches across, wide enough that it will not settle on the tortoise as he tunnels under it. Use a stick to start the channel. Place the hatchling inside. The tortoise will lengthen the tunnel to suit himself. If a larger tortoise has access to the front of the burrow, watch carefully that he does not try to enlarge it for himself. (See FIG. 3)

You may choose to set aside part of your yard for hatchlings only; however, arranging to have sunlight available for most of the day becomes more difficult as you subdivide your yard. The fewer fences, the more room for all your tortoises.

The sound and/or smell of rain or sprinklers seems to rouse the hatchlings to drink. This natural response includes searching the surface of rocks for pits that collect tiny puddles of water. We have found that a lava rock with pits and depressions ½ to 2 inches across is an ideal drinking site if kept free of soil and leaves and placed near the hatchling's burrow. Such lava rocks can be purchased at an aquarium shop. A shallow crockery dish will do just as well if not too large (3-6 inches across), sides about ½ inch high.

Set the dish *in* the ground as you would for larger tortoises. Make sure that when the dish is full of water the smallest tortoise that you have can get in and out and while standing in it can easily hold his head above water. See that the hatchling accepts the dish; if not, try a smaller size. Be sure to keep the water clean and build a roof over the areas so the water is always shaded.

If you sow alfalfa, clover, and grass; grow dandelions and perhaps filaree and mallow, the hatchlings will remain independent feeders, growing slowly but well. Once you begin offering prepared food, you promote rapid growth which must be supported with additional protein, calcium and vitamins. Such youngsters learn very quickly to beg for food. They lose their shyness but become *very* dependent.

If you are not prepared to keep your hatchlings, call TORT-Group. If you know this when your tortoise lays eggs, call us then.

MEDICAL PROBLEMS

The most common accidents that result in death or severe injury include falling into swimming pools, torn limbs from attempts to climb or get through wire fencing, tipping over from climbing over piles of stored material or attempts to get through wire fencing, and punctured and broken shells and limbs from dogs. Tortoises have amazing if slow healing powers and you should seek veterinary help, even in the case of apparent drowning. Preventing maggot infestation of a wound will be important following emergency treatment.

Respiratory problems are common. Signs include runny nose and difficulty breathing. Antibiotics may prevent pneumonia and death but the condition often becomes chronic regardless of treatment and may become acute at any time. The difficulty in healing tortoises with respiratory problems seems to be partly because of the unique structure of tortoises' lungs and partly because the predisposing causes remain. These include stress from the humidity extremes we impose, stress from improper diet, and stress from crowding.

A third group of medical problems is gastrointestinal. A need for minerals may cause the tortoise to eat pebbles that are large enough or are in such large amounts that intestinal impaction results. This is often fatal. Swollen eyelids, a flat and/or persistently soft shell indicate nutritional deficiencies and a veterinarian should be consulted. Intestinal parasites may be a hidden problem. Have your tortoise checked by a veterinarian. Treatment is no longer a harsh procedure. To reduce the chance of reinfestation, collect tortoise droppings as soon as possible and discard them in the garbage. In the Las Vegas-Henderson area there are several veterinarians who have experience with tortoise problems. Call TORT-Group for their names.

ADOPTION

After you have read this Care Sheet, understand how you will need to prepare your yard, and want to adopt a tortoise, call 739-8043 or 451-1154 and you will receive an Adoption Application to fill out and return. When your application is approved and your facilities checked for readiness you will be called when a tortoise is available. You may adopt more than one and choose the sizes and sexes.

As soon as you can after receiving your tortoise we suggest that you take color photos of your tortoise's shell: close-ups to show 1) the entire upper shell and 2) irregularities and their locations relative to the rest of the shell or body. Scars, missing parts, shell plates of unusual shape or number, dimples, creases, and worn areas of the shell are like fingerprints and will help to identify your tortoise if it ever gets away or is stolen.

Before you take the photos, make a small paper or card label like this:

Harry Blankenship
Phone: 123-4567
"Sandy" 4½"
April 20, 1985

Tortoise's name, sex if large enough for you to tell, size (see TORT-Group Info. Sheet No. 3), and date of photo.

Make the label just large enough to hold the information, yet be legible through the camera. You will need a small piece of transparent tape for attaching the label in the best place for each photo.

Never cover a tortoise's shell with paint or drill holes through the shell. The shell is living tissue; drilling causes pain and serves no purpose.

If you lose your tortoise, call us. Your tortoise may be among the many that are found and turned over to us.

THE UNWANTED TORTOISE

Tortoises obtained through TORT-Group should not be given away. If you no longer can keep it, return it to us. A pet tortoise becomes dependent and will need custodial care for the rest of its life (50-100 years) including when you leave on vacation. If you must give up your tortoise or if you find one wandering in town **do not release it in the desert, call TORT-Group.**

WHY DOMESTICATED TORTOISES SHOULD NOT BE RELEASED IN THE DESERT

Research indicates that domesticated tortoises do not dig burrows as readily or as adequately as wild tortoises. A released pet becomes an intruder in every established burrow he happens to enter. Pets may carry disease and parasites which are not apparent. The respiratory disease so common among pets is very rare among wild tortoises. The lack of fear in domesticated tortoises makes them easy prey for their natural enemy the coyote. The chances for domesticated tortoises' survival are poor and as a result of their presence among wild tortoises, all tortoises may suffer.

The wild population of tortoises is presently threatened because the amount of natural desert habitat decreases each year, usurped by construction and other uses. The quality of the remaining habitat is decreasing because of the many demands made upon it, for example, mining, grazing, off-road vehicle recreation, a[illegible] vehicle access for hunting, oil and gas exploration, a[illegible] uncontrolled trespassing. The desert recovers from even transient use at a very slow rate, *recovery is slower than degradation; therefore, degradation accumulates. As a result, the habitat can support progressively fewer animals.*

Wild tortoises depend upon the annual plants that start to grow in winter *if* there is enough winter rainfall. These plants are eaten by tortoises in early spring. Field experiments and measurements have shown that even one pass of a vehicle, off the road, reduces the production of annuals along the track by compacting the soil and disturbing the shallow layer of seeds. Now consider not only this diminishing food supply but the fact that in winters with little or no rain there is insufficient forage for the wild tortoises. **To release additional tortoises (domesticated or their hatchlings) into this situation would increase the competition for the limited food resulting in a greater number of deaths from starvation.**

NEVER REMOVE A TORTOISE FROM ITS WILD HOME IN THE DESERT

Free-living tortoises are protected by law and must not be collected. There is already an excess of dependent, domesticated tortoises that need homes.

A tortoise recently removed from the wild should be returned to the place where found — the spot or within a few yards of it. This is important because a tortoise spends its long life in one relatively small area, becomes very familiar with it and *knows where its burrows are, burrows that are necessary for the tortoise's surviva[illegible]*

Please call TORT-Group to help you in this situation because there are several things to consider before replacing the tortoise; among them, the time of year, time of day, the condition of the habitat where found, and how long the tortoise has been in captivity.

Tortoises often cross roads and highways through the desert. To *rescue* a tortoise found on such a road where traffic is heavy or fast, pick up the tortoise and move it several yards beyond the side of the road toward which the tortoise was heading. *Do not collect the tortoise.*

ADDITIONAL INFORMATION AVAILABLE TO YOU

If you have unanswered questions about tortoises, call any of the numbers listed previously. Our monthly meetings are an enjoyable way of learning more about tortoises and sharing tortoise experiences. Nonmembers are welcome. Guest speakers include veterinarians with experience treating sick and injured tortoises. One of our members is a biologist who works in the field with wild tortoises. She shares information with the group. Among the free information sheets are: Sheet No. 2, Determining the Age and Sex of Your Desert Tortoise, and Sheet No. 3, Measuring Tortoise Size. We can give you information about Box Turtle care and the care of other land turtles. There is much to be done for both wild and domesticated tortoises. Join us, your ideas and talents may be just what we need.

MEETINGS: Public is welcome. Call 739-7113 about next meeting.

TORT-GROUP DESERT TORTOISE ADOPTION APPLICATION

The following should help you to decide if a tortoise would fit into your household and help you to prepare for the tortoise. PLEASE USE IT IN COMBINATION WITH THE INFORMATION IN TORT-GROUP'S "HOW TO ADOPT AND CARE FOR DESERT TORTOISES" (available free from any veterinarian's office or city library in the Las Vegas area.

1. The tortoise must live out-of-doors. What is the size area where you plan to keep your tortoises? ______________________________

2. Is there a pond or swimming pool in the above area? ______. If "yes" and it is not fenced, there is always the possibility that some day the tortoise may fall in and drown.

3. Of what material(s) is your fence?_____________________ If the fence is of wood or wire mesh, have you buried a barrier of wire mesh, or wood to prevent the tortoise from digging under? ______ Have you eliminated all spaces at the base of the fence that naturally attract the tortoise? _______ If the fence is of wire, have you secured boards at least 12 inches high all around the base (including any wire gate) to prevent the tortoise from trying to get through (being taunted) or becoming caught in the wire when attempting to climb or push through? _______

4. Is there a barrier across the base of all gate openings so that when the gate is open the tortoise cannot see through or pass through the gate and you must step over the barrier?______. This barrier should be at least 16 inches high. It may be removable if a lawnmower and other heavy items must go through but should be replaced immediately and be very secure when in place.

5. Does each gate-latch close securely?________ When the gate is closed will stray dogs be kept out?________

6. Have you considered the dogs and other animals that you may have that may come in contact with the tortoise?______ Cats are seldom a problem and a dog usually learns quickly that you do not want it to touch the tortoise. However, your animals' responses to the tortoise are not predictable. Jealousy, playfulness, or hunting instincts may result in injury to the tortoise. Merely a dog's curiosity can lead to harm if the dog rolls the tortoise on its back. Are you willing to BE WATCHFUL and will you be available to watch especially during the first few days after the tortoise arrives? ________

   Tortoises are breakable. Will controlling any children that play in the yard be a constant problem with regard to not picking up the tortoise?______ Also, if the yard is often used for games like baseball, soccer, football, badminton, etc. The tortoise is in danger.

7. Have you eliminated the other hazards mentioned in the Care Pamphlet?_______ The

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1. The tortoise must live out-of-doors. What is the size area where you plan to keep your tortoises? ____

2. Is there a pond or swimming pool in the above area? ______. If "yes" and it is not fenced, there is always the possibility that some day the tortoise may fall in and drown.

3. Of what material(s) is your fence?____________________ If the fence is of wood or wire mesh, have you buried a barrier of wire mesh, or wood to prevent the tortoise from digging under? ______ Have you eliminated all spaces at the base of the fence that naturally attract the tortoise? _______ If the fence is of wire, have you secured boards at least 12 inches high all around the base (including any wire gate) to prevent the tortoise from trying to get through (being taunted) or becoming caught in the wire when attempting to climb or push through? _______

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7. Have you eliminated the other hazards mentioned in the Care Pamphlet?_______ The tortoise likes to travel along the edges of the yard. It will try to climb over rather than go around things that are there. This is one way that tortoises differ from other pets and it leads to unexpected accidents.

8. At least one burrow per tortoise must be ready before you receive a tortoise. Is the burrow ready? ______ See the information sheet on recommended burrow dimensions and reread the information in the care pamphlet on SHELTER very carefully. To save you additional work if the burrow needs some changes, you may complete it to the point that you would replace the soil on the roof. Leave the soil off until the a member of our Adoption Committee comes to check your yard for readiness.

9. Are sunshine and shade available to the tortoise at all times of the day and year?_________

10. Is there a permanently shaded, fresh water source?________

11. Tortoises naturally forage for their food. What growing foods are always available to the tortoise? ______________________________________
    Preferred plants that you should make available include bermuda grass and dandelions.

    Are you aware that grass alone is not enough to keep a tortoise healthy? _______ Are you aware that lettuce is a very poor source of nutrients and that tortoises may eat lettuce to the exclusion of nourishing foods?________ Are you prepared to feed the tortoise the prepared salad recommended in the care pamphlet?________

(over)

12. Do you agree to use only liquid fertilizer during the season that tortoises are active? ________ The tortoise may accidentally eat slow dissolving fertilizer when grazing. Do you agree not to use weed killer or pesticides?________

13. If you leave home for vacation have you considered the provisions that you should make for the care of the tortoise during your absence?__________

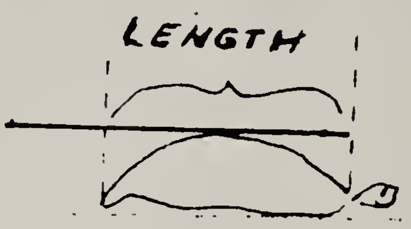
14. Are you willing to pay for the veterinary services that your tortoise may need?__________

____Date ______________________
Signature (parent or legal guardian must sign for children under 18)

YOUR REQUEST

Please write in the number of tortoises that you want by size (and sex if adult or subadult.)

Tortoise size = upper shell length when you lay a stiff ruler on the middle of the back and sight down from the front edge to the rear edge of the upper shell.



Size-group	Upper shell length (approximate inches)	Number and size wanted
small juvenile	2 - 4	
large juvenile	4 1/2 - 6 3/4	
subadult (male)	7 - 8	
subadult (female)	7 - 8	
adult (male)	more than 8	
adult (female)	more than 8	

1. Do you have tortoises now?______ If so, please list by size and sex____________

2. Name______________________________________Phone (home)__________________
(business)__________________

Address____

City________________________________ Zip Code__________________________

3. Your home is a: House_____ Trailer_____ Apartment with an outdoor area ________

The following is the name address and phone number of the TORT-Group person arranging the adoption. Please copy it for your later use.

____

RETURN THIS FORM (COMPLETED) TO THE ABOVE WHEN YOUR YARD IS READY FOR THE TORTOISE, NOT BEFORE. IF YOU HAVE ANY QUESTION ABOUT HOW TO COMPLETE ANY PART OF THE PREPARATION THE PERSON ABOVE WILL BE GLAD TO HELP YOU. After the completed application is returned the TORT-Group person will call and arrange a time to visit your yard that is convenient for you.

The space below is for the TORT-Group person arranging the adoption.
Date application sent: Date application returned:

Date Visits to yard, comments, and sizes and sexes of adopted tortoises

May 1989

MEASURING TORTOISE SIZE

Equipment: a stiff ruler (12 inches or more) with legible 1/8th inch or millimeter divisions, a pen, and a piece of paper on which to record the size.

The standard measurement used when referring to a tortoise's size is the length of the upper shell (carapace). The measurement is a straight line (not following the curve). Shell dimensions are expressed in millimeters (mm) but may be expressed in inches.

The following describes how to measure for approximate length if calipers are not available: Place the tortoise against a wall without moulding as shown in Figure 1. Lay a stiff ruler along the length of the shell in the mid-line making sure that both the back edge of the carapace and the end of the ruler with the lowest numbers are touching the wall squarely. Look directly down at the middle of the front edge of the small scute in the center of the front edge of the carapace--the nuchal scute, pronounced: [n(y)úkəl sk(y)út]. Adjust the position of the ruler so that the millimeter (or inch) divisions appear to be directly over the mid-line of the carapace and the front edge of the nuchal. Check the end of the ruler that should be squarely against the wall and check the end of the tortoise too.

When all are lined up as in Figure 2, place the edge of your index fingernail or thumbnail on the appropriate measurement as you grasp the ruler. Lift the ruler and read to the nearest millimeter or to the nearest 1/8th inch. Record the carapace length (CL) including the proper symbol -- mm or in.

It is always a good idea to start from the beginning and take measurements again. Repeat until at least two measurements are the same.

STANDARD CARAPACE LENGTH

Figure 1.

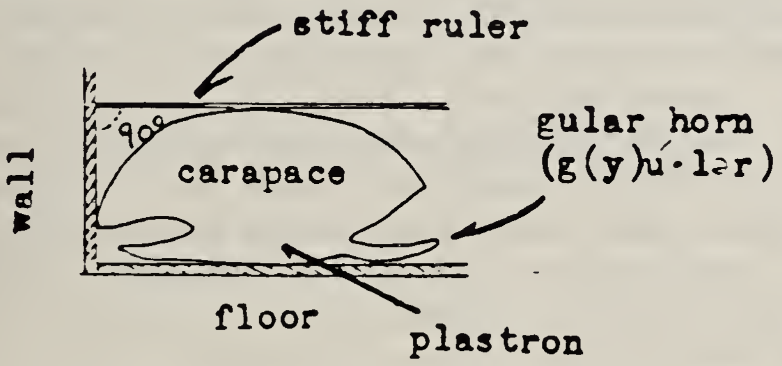
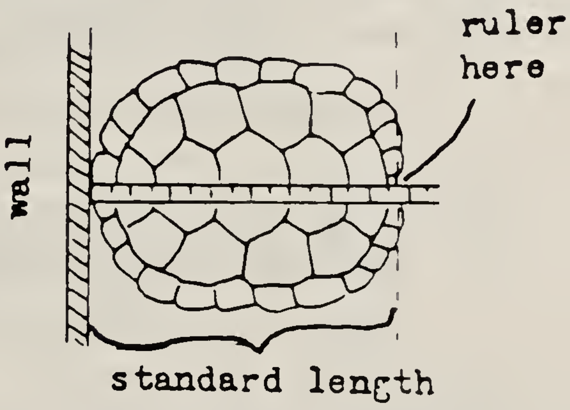


Figure 2.



TRANSPORTING TORTOISES

Use a Cardboard carton with a complete lid. The carton should be slightly larger than the tortoise--allows it turn around but high enough that the tortoise cannot put its forelegs over the top edge while standing upright.

Place several layers of folded newspaper on the bottom to absorb any urine that the tortoise passes under the stress of the trip. Cover the newspaper with an old towel if one is available; it will be less slippery than the newspaper.

Prepare the box, the car, and any one or any thing else that you plan to take with you before you place the tortoise in the box. When you are ready to go, place the tortoise in the box and close the lid. The tortoise is more likely to remain still in a dark place.

DO NOT TRANSPORT A TORTOISE IN THE TRUNK OF A CAR OR IN THE OPEN BED OF A TRUCK. Put the box with the tortoise close to you on the floor of the front seat where you can watch the box and easily reach it if the tortoise tries to climb out and falls on its back. Do not put the box on the seat unless there is someone with you to prevent the box from sliding to the floor if you should brake suddenly.

In hot weather: 1. Keep the box out of the sunshine BUT also out of drafts from open windows. 2. Do not leave the tortoise in a parked car. 3. If there is a choice, transport the tortoise in the cool part of the day.

TORT-Group Information Sheet #2

DETERMINING THE AGE AND SEX OF YOUR DESERT TORTOISE

Accurately determining the age of a wild tortoise or a domesticated tortoise that has spent only part of its life in captivity is usually not possible. This is because the rate of growth depends upon the amount of body building food eaten. Both wild and domesticated tortoises may develop none to several growth rings per year depending upon the quality and quantity of food available. Growth rate decreases after maturity is reached and wear and weathering may eventually remove all the growth rings. A tortoise with a smooth shell is obviously old, but how old? Tortoises live about as long as human beings.

It is possible to raise a tortoise to sexual maturity in four years, but this is not usual. The estimated age of a sexually mature, wild tortoise is 15 - 20 years. Wild females probably produce eggs by the time they are 208 mm. This may be the same for captives but the number of years to reach 208 mm varies.

The following table is used by many biologists studying tortoises

Maturity level	*Carapace length**
Adult	*208 mm (8 inches or more)*
Subadult	*180-207 mm (7 - 8 inches)*
Lg. juvenile	*100-179 mm (4 - 7 inches)*
Sm. juvenile	*less than 100 mm (4 inches)*

These divisions are not strict and the size at sexual maturity may differ between males and females.

The sex of a desert tortoise is usually not possible to determine with certainty until the tortoise is about 180 mm. By then, a slight depression (concavity) is evident in the posterior third of the plastron if the tortoise is a male. As growth continues, the male's concavity becomes more evident; whereas, the female's plaston remains flat.

*Other physical characteristics of males include a longer tail, longer gular horn**, and larger ultimate size than females; however, these are average, comparative values and differences may not be useful until you have examined many tortoises.*

The gular horn of a free-living tortoise is often deformed or irregular and is not fully developed in the juvenile. By the time the horn might be used to separate the sexes the presence or absence of a plastral concavity is obvious.

As males mature they develop noticable chin glands, one on either side near the front of the lower edge of the jaw bone. The enlargement of these glands is usually seasonal so that some times of the year the glands of males may be as small as those of females.

Recently researchers have shown experimentally that for some turtle species the temperature during incubation can significantly affect the sex of the hatchlings. However, until research with the desert tortoise proves otherwise, the 50:50, male: female ratio typical of vertebrates (animals with backbones) should be assumed to hold for the tortoise.

** See TORT-Group's Information sheet #3: Measuring tortoise size*

***pronounced - g(y)ú - lər -- The horn projects from the front of the plastron (lower shell)*

(over)

RECOMMENDED DIMENSIONS WHEN DIGGING TORTOISE BURROWS
AND
SPECIAL INSTRUCTIONS

Please refer to the diagrams on page 3 of the care pamphlet, "How to Adopt and Care for Desert Tortoises" and reread the section on SHELTER.

1. Plywood 3/4 inch thick is recommended for the roof. Thinner material will progressively sag from the weight of the overlying soil particularly after rains. As a result the tortoise may be trapped or crushed.

2. The burrow channel is to be the same height and width all the way to the end. The entire channel is to be slanted downward at approximately 15 degrees (see Figure 2, on page 3). Note that the roof is the same distance above the floor over the entire length. This snugness is important for insulation.

   At the far end it may be necessary to enlarge the burrow width slightly to allow the tortoise to turn around. In the ideal burrow, as in a wild tortoise's burrow, the tortoise cannot turn around mid-channel!

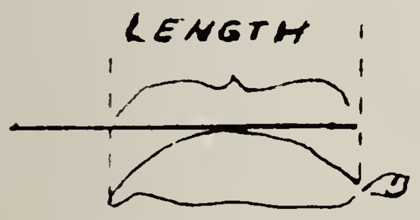
3. After digging the channel for the tortoise, carefully make a shelf along both sides for the entire length and across the far end to support the plywood roof (see Figure 1, page 3). Do this by carefully shaving and scraping the shelf by small amounts until it is slanted downward the correct amount above the floor. Periodically slide the plywood into position to check for fit. Make the fit along the edges of the plywood as snug as possible.

4. Loosen soil along the entire length of the floor so that the tortoise can dig down at least 5 inches if necessary. This precaution is very important if you are digging through caliche. It will allow the tortoise to dig its way out if the roof sags, or as the tortoise grows, and is especially important for females who often dig the nest in the burrow floor.

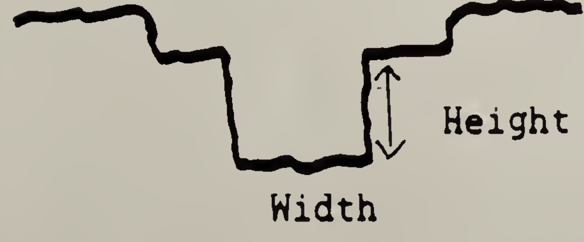
5. Do not use blocks or boulders to support the roof. Tortoises tend to dig under them and cause them to settle on the tortoise or tip over and obstruct the channel. If your soil is too loose to maintain a shelf we can offer other suggestions for supporting the roof. Some supports are potentially dangerous, so let us share our experience with you.

   The boulders shown in Figure 3 on page 3 are wedged in only at the opening of a small tortoise's burrow to discourage large tortoises from widening the opening The boulder at the opening in the photograph (page 3) does not support the roof.

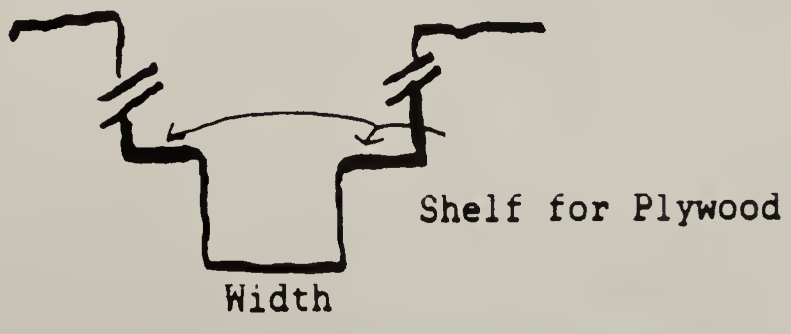
For tortoise sizes not given in the table choose dimensions between the closest sizes given



	Tortoise Shell Length	BURROW CHANNEL Width	Height	Length	Size of 3/4" Plywood
Juvenile Small	1 3/4-2 1/2"	2-2 1/4"	3/4-1"	10-15"	8 X 24"
	3"	2 1/2"	1 1/2"	18-24"	8 X 30"
Juvenile Large	4 1/2"	4 1/4"	2 3/4"	18-24"	12 X 36"
	6"	5 1/4"	3 1/2"	36"	15 X 48"
	6 1/4"	5 1/2"	4"	36"	15 X 48"
Sub-Adult	7-7 3/4"	6 1/2"	4 1/2-5"	36"	18 X 48"
Adult	8"	8"	5 1/2"	48-60"	24 X 72"
	9-11"	10"	6"	48-60"	36 X 72"
	> 12"	10-12"	6-7 1/2"	60-72"	36 X 84"



AT OPENING



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SPRING IS TORTOISE TIME!

Spring is Tortoise Time! With the arrival of warm weather, desert tortoises are slowly emerging from their deep, underground burrows after a six-month long hibernation. The spring months are usually the prime time to view our State Reptile, because the tortoises feed on spring wildflowers. In your visits to the desert, you are likely to see tortoises munching away on flowers and grass, walking across roads, and courting or fighting. When you see a tortoise, try sitting very quietly 10 or 20 yards away and watch what it is doing. If you are exceptionally lucky, you might see a female digging a nest for her eggs in late spring or a tortoise eating soil at a mineral lick! Wild tortoises also can be very curious about you. Some desert visitors have been in the process of photographing a tortoise, only to have it walk over to sit in the shade of the camera bag.

The desert tortoise needs your help, more than at any other time in history. Populations are declining precipitously, especially in the western Mojave Desert. In the last six to eight years, tortoise numbers have dropped from 30 to 70% in the region bordered by Palmdale in the south, Mojave in the west, Ridgecrest in the north, and Barstow in the east. Principal causes are vandalism (shooting), crushing by vehicles, collecting, and habitat loss.

You can be a part of our effort to reduce the declines by remembering a few key points and sharing them with your friends and family.

- The desert tortoise is fully protected by State Fish and Game regulations and must not be collected or harassed. If someone

takes a tortoise from the desert, State Fish and Game wardens or other law enforcement authorities should be contacted. Hopefully, some of the recently collected tortoises can be returned to their original home sites.

- When you see a tortoise on the road, move it carefully off the road about 50 yards in the direction it was headed. Since each tortoise has its own activity area or home range with several burrows and feeding areas, it is important not to move it beyond the home area. If the tortoise is removed from familiar territory, it may use up precious stores of energy trying to return home. Displaced tortoises are more vulnerable to predators and overheating.
- When you are camped or parked, check under your car before driving away. Sometimes tortoises will sit under a car or trailer in the shade and can be inadvertently crushed.
- Remind your family members and friends not to shoot a tortoise with a pellet gun or other type of firearm. Young people with new guns are often tempted to shoot animals and guidance and education. New residents and visitors to California often are not familiar with hunting and shooting regulations.
- Follow local regulations about vehicle travel off-road. Many tortoises are killed or injured each year by unauthorized cross-country vehicle travel.
- Don't release captive tortoises! Captives often carry diseases which can be transmitted to the wild populations with devastating effects.

Above all, enjoy your experience with the desert tortoise. The tortoise has lived in the California desert for millions of years and hopefully can continue as part of the landscape for many more. Please do your part to help protect this dwindling species.

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COVER: Desert silhouette: organpipe cactus against a resplendent Arizona sky. Photo by Jim Anderson.

The Nature Conservancy is a national conservation organization committed to the preservation of natural diversity by protecting lands containing the best examples of all components of our natural world.

To date the Conservancy and its members have been responsible for the preservation of 1,585,347 acres of forests, marshes, prairies, mountains, and islands: home to rare and endangered species of wildlife and plants. 2,231 projects have been completed since the acquisition of the first preserve in 1954. Approximately 60% of all preserves are retained by the Conservancy and managed by volunteer land stewards.

A membership, non-profit organization, the Conservancy was incorporated in 1951 in the District of Columbia for scientific and educational purposes.

A copy of the last financial report filed with the Department of State may be obtained by writing to: New York State, Department of State, Office of Charities Registration, Albany, New York 12231, *or* The Nature Conservancy, 1800 North Kent Street, Arlington, Virginia 22209.

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Tortoises for Tomorrow

by Kristin H. Berry

Although I grew up in the western Mojave Desert and had several desert tortoises for backyard pets as a child, we didn't really become acquainted until I was almost finished with graduate school. I was writing my dissertation on the ecology and social behavior of another long-lived desert reptile, the chuckwalla lizard, when the California Division of Highways asked me to take on their "Desert Tortoise Relocation Project." The project involved removing wild tortoises from a freeway corridor and locating new home sites for them. One thing led to another, and within a year, I was enmeshed not only in research on the behavior and ecology of wild tortoises, but launched on a campaign to preserve one of the prime remaining desert tortoise populations in the United States.

Tortoise History

The desert tortoise is a reptile of the arid lands in the southwestern U.S. and northwestern Mexico. It was once widespread in the southern deserts of California, extreme southwestern Utah, southern Nevada, and western Arizona. Until the 1930's and in some places until the 1950's, population densities of several hundred tortoises per square mile could be found in parts of its geographic range. Long-time desert residents in California noted extraordinary densities that could have been as high as 2,000 per square mile. Colbert Eyraud, now the owner of Cabot's Old Indian Museum near Palm Springs, remembers this era. He lived on a ranch in the western Mojave Desert when he was young, and travelled with his uncle to drill wells for water from 1921 to 1931. In those days he could find 20 to 30 tortoises within a half-hour. Toby Johnson, now a County Supervisor in Sacramento, spent the spring and summer of 1933 working as a recorder for the U.S. Geological Survey in Antelope Valley, when tortoises "were everywhere . . . all over the ground." He saw over 100 in one place at one time. Roberta Starry, an historian, author, and naturalist, recalls seeing 150 to 200 at one time in a small valley near her home in the western Mojave Desert in the early 1950's. Densities may have been over 2,000 tortoises per square mile in the Mojave.

Reports of high densities are not confined to California. In Utah Angus Woodbury and Ross Hardy began a ten-year study of the ecology of tortoises on the slopes of the Beaverdam Mountains in 1935. Their classic study cited densities of 150 tortoises per square mile.

All this has changed. Tortoise populations have been extirpated from many areas, and where they now occur, are generally in low densities of 5 to 50 per square mile. At this density, a person would have to walk all day to see two or three. Most populations with such low numbers cannot survive more than a few more decades. The numbers are just too low, with too few breeding females and too few young individuals.

In August 1978 the Office of Endangered Species (OES) of the Fish and Wildlife Service formally proposed the desert tortoise population in Utah for federal listing as an endangered species. At the same time, the OES requested a review of the population status in Arizona, Nevada, and California. Studies now underway indicate that tortoise populations in these three states probably qualify for federal threatened status. (Endangered means endangered with extinction; threatened means threatened with endangerment.)

Tortoise Sensitivity and Lifestyle

Tortoises have several life history characteristics and behaviors that make them susceptible to human activities. They are long-lived, reaching 60 to 80 or more years of age, and require a long period to reach reproductive maturity. Most wild tortoises don't breed until they are 15 to 20 years old. Once sexual maturity is reached, reproductive potential is low. Females lay from 4 to 12 or more eggs, each the size and shape of a ping-pong ball. They excavate a nest at the entrance to a burrow or near the edge of a shrub. The nest is then covered with sand and abandoned. Eggs are usually laid in late spring, from May through June, but not necessarily every year. The time required for

hatching depends upon the warmth of the nest. Eggs usually hatch after two to four months, but may take up to six months.

The little tortoises, which are called "hatchlings," usually emerge from the nest in fall. They must immediately find shelter from temperature extremes and predators. Very few live to maturity, perhaps only 2 to 5 out of every 100. The little tortoises are about 2 inches in length and very fragile. The shell is thin, like a human fingernail, because there is no underlying bone.

Many natural predators eat hatchlings and young tortoises. Snakes like the red racer, gopher, glossy, and Mojave rattlesnake easily eat these tender morsels. Roadrunners and ravens often peck open the shells and eat them. Desert kit foxes, spotted skunks, badgers, and coyotes can swallow them in one bite. Tortoises are somewhat less vulnerable after reaching lengths of 4 to 5 inches and 7 years of age. At that time, the bony skeleton has developed under the thin shell.

As the tortoise gets older, it becomes more resistant to predators. When it reaches adulthood, it is about 7½ to 8 inches in shell length and weighs 4½ pounds. At 40 to 60 years of age, it may reach a length of 14 inches and weigh over 17 pounds.

Even after attaining a large size, tortoises are not safe from predators. I have seen tortoise shells in golden eagle eyries and have found the fresh remains of tortoises killed by coyote and kit fox. But the reptiles have survived for millions of years with such predators. Predation is just another part of their life history.

Tortoises have been able to survive partly because of their habit of living in dens and burrows. The burrow shields the turtle from the extreme heat of summer and the below freezing temperatures of winter. Burrows provide a refuge from lack of moisture and protection from predators.

The burrows are easily recognized because they are half-moon in shape, just like the profile of a tortoise shell. Little tortoises have little, rat-like burrows, and the large tortoises have much larger burrows. The length of the tunnels varies considerably according to location. Burrows in the western Mojave Desert in California are generally no more than 10 feet in length, whereas those in Utah may be up to 30 or more feet and have several chambers and side tunnels. The greater tunnel length in Utah is probably associated with the colder, longer winters.

Much of the life of the tortoise is spent underground, perhaps six to nine months each year. Tortoises enter winter hibernation in September and October, and emerge any time from late February to early April. Emergence time depends upon local weather conditions. During spring, especially when there is a carpet of wildflowers, tortoises are active above ground, feeding, courting, and traveling. Retreat to the burrows comes with the onset of high summer temperatures. The summer period

A female
arched e

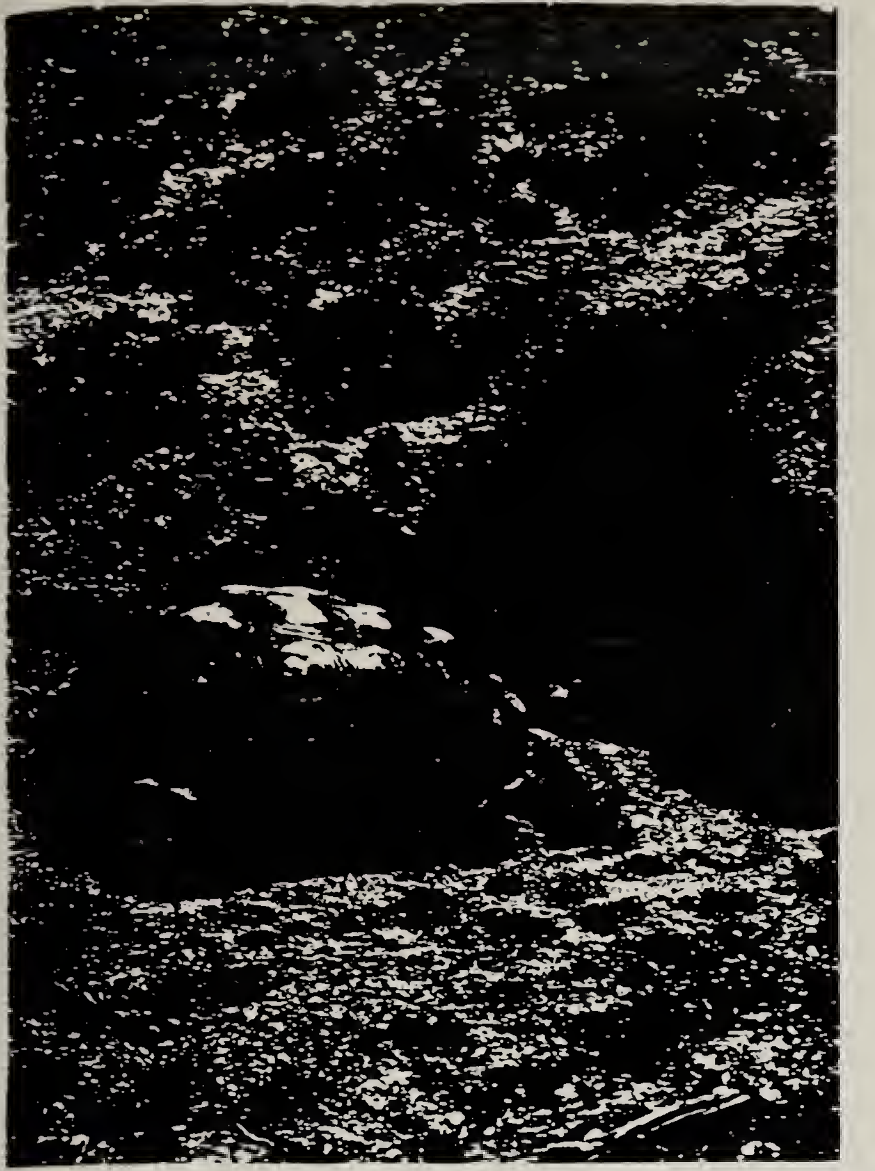
Above, the rich and varied creosote scrub plant community of the Desert Tortoise Preserve in California's Mojave Desert sustains more than 200 tortoises per square mile. Right, tortoise courtship among the alkali goldfields: an aggressively amorous male bites the rear leg of his prospective mate.

of retreat and inactivity is called estivation.

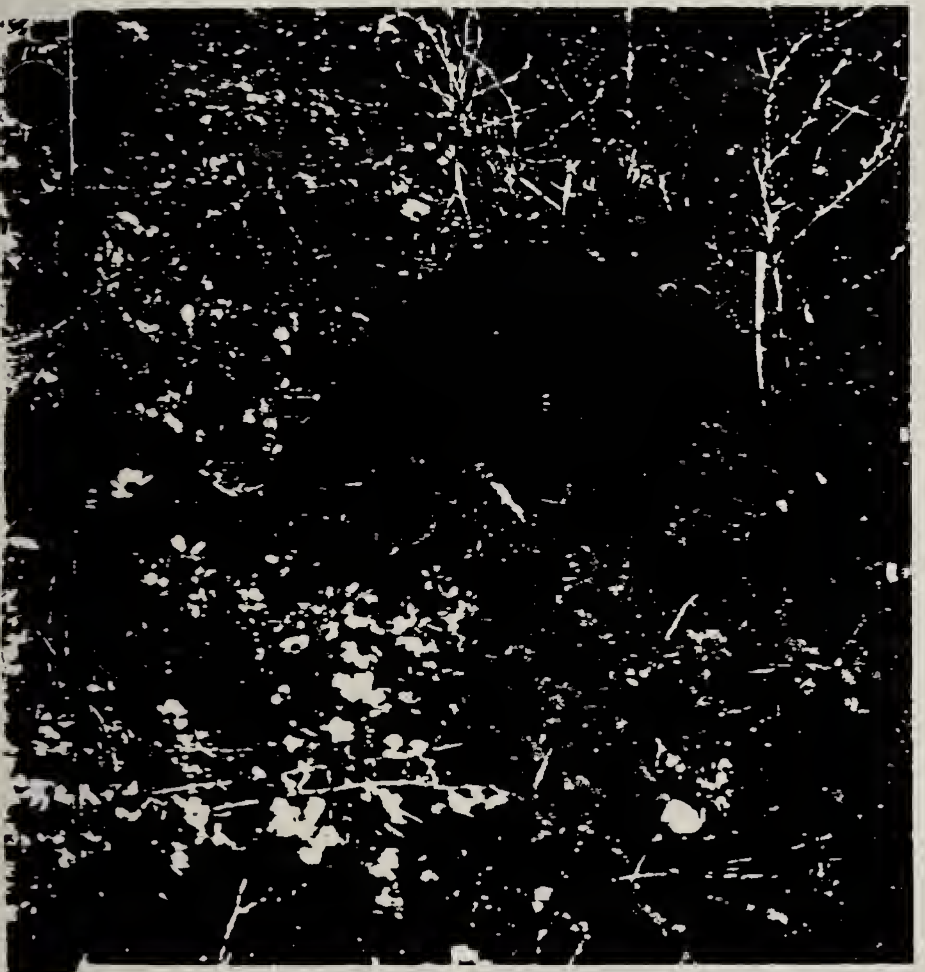
Soon after leaving the dens in late winter, tortoises begin eating annual wildflowers and grasses. The wildflowers are the reptile's prime food in California, whereas grasses are more commonly eaten in Arizona and Utah. Flowers are available only for about three months. The yellow blazing stars, purple phacelias, pink gilias, orange mallows, and little white forget-me-nots are choice foods. Tortoises move through this smorgasbord of flowers, picking and choosing their favorites.

In years of drought, there is little or no fresh food, even in spring. Tortoises must eat enough during lush wildflower years to survive the droughts. During dry years, they spend most of the time underground, surviving on water and fat stored during more plentiful times.

Spring is not only the prime feeding time. It's also the time for socializing and traveling. Tortoises have definite activity areas or "home ranges." The size of the home range depends on a tortoise's size and sex. A little tortoise may have a small activity area with a radius of only 50 yards, whereas a large male may be familiar with and travel over a one-half-to a square-mile area. Females are more sedentary than males.



A female desert tortoise basks in the sun before the arched entrance to her burrow.



Threats to Tortoises

Threats to the integrity of desert tortoise populations and to habitat come from almost every source. Tortoises live in valleys and on slopes of mountain ranges, the areas most heavily used by people. Direct threats to their populations include vandalism, collections for pets, and commercial exploitation. Collecting for pets and for commercial sale was widespread and extensive for many decades. Undoubtedly it is responsible for lowering population levels in many areas, especially close to cities. All four states with desert tortoises now have some form of protective legislation, but a certain amount of illegal traffic continues.

Habitat deterioration and loss is by far the most serious danger to the desert tortoise. Agriculture, urban development, creation of dirt and paved roads, military maneuvers, off-road vehicle use, and mining and energy development all threaten the existence of these slow moving, shell-backed creatures.

Prime tortoise habitat has been cleared for agriculture and subdivisions throughout the Southwest, mostly near cities and towns. Not only have people cleared lands for their own use, but they have ranged out into the desert collecting tortoises. Domestic and feral dogs and cats also kill or injure the reptiles and destroy burrows within a radius of several miles from towns and ranches.

Dirt and paved roads, railroads, aqueducts and canals have accounted for millions of lost acres. But reduction of habitat is not the only consequence. Tortoises living adjacent to roads or railroads are killed during their travels. Recent studies indicate that populations adjacent to heavily-used paved roads may be depleted to distances of one-half mile on either side of the road. This may not seem so important, but there are often two miles of roads per square mile of prime habitat.

Most Americans are not aware that the desert was used by General Patton to train troops for the North African campaigns during World War II. Tank tracks criss-cross thousands of square miles of tortoise habitat in the Mojave and Colorado Deserts. The impact on tortoise and other animal populations must have been immense. Other major military operations also intruded on the reptiles' habitats in 1964 and 1976.

The impact of roads and trails on tortoise terrain is dramatically obvious, but the subtle effect of livestock grazing cannot be underrated as a danger. Cattle and sheep have browsed desert ranges since the 1850's in Nevada, Arizona, and Utah, and since the 1870's in California. Consequently, the land has deteriorated and is now in fair to poor condition. More than 90 percent of the land where tortoises make their home also provides food for livestock. In the resulting competition for food, burrows are trampled, young tortoises crushed, and habitat generally downgraded. A new handicap in the reptile's struggle for survival is the expanding feral burro population.

In the late 1960's another threat arose, one which literally has consumed hundreds of square miles of habitat—the off-road vehicle. In California, most prime habitat is used intensively by off-road vehicles, and—whether in the form of motorcycles, dune buggies, or 4-wheel drives—they have serious impacts on tortoises. Recreationists in these machines crush tortoises and burrows, damage the wildflowers, destroy shrubs used for shade, and compact and erode soils so that plants won't grow.

Saving Tortoises for Tomorrow

Tortoises, because of their sensitivity to environmental changes, are excellent indicators of the health of lowland desert ecosystems. Like the tortoise populations, these lands are gradually dying by fragmentation. Soon there will not be enough large blocks of relatively undisturbed habitat to support either the tortoise or other, larger species such as the kit fox, prairie falcon, and golden eagle.

There is some hope of preserving a small portion of prime tortoise habitat. In 1972 I asked the Bureau of Land Management (BLM), under the U.S. Department of Interior, to establish a preserve for the desert tortoise on the site of the highest known population densities. The area selected was one of the last remnants of a once widespread lowland Mojave Desert ecosystem that was besieged by competitive motorcycle racing, sheep grazing, and threats of agricultural and urban development. It contains the richest and most diverse creosote scrub plant community with over 160 plant species—a community that supports over 200 tortoises per square mile. It is home to the rare Mojave ground squirrel, desert kit fox, and many other small animals. The Bureau of Land Management responded a year later with a proposal to form a natural area on 30 square miles of mixed public and private properties, and closed the area to recreational vehicles.

In 1974, I and several other California desert residents formed the Desert Tortoise Preserve Committee in order to make this preserve a reality. We worked toward enlarging the boundaries to form a viable preserve and on raising funds for a fence and to acquire private land. Committee members also led tours, gave lectures, and developed interpretive materials for the preserve. In 1976, the Committee came under the wing of The Nature Conservancy as a project committee.

Seven years after the initial proposal, we are much closer to a viable natural area for the tortoise. The Bureau of Land Management has provided a woven-wire fence that almost completely surrounds the now 38-square-mile preserve. BLM will soon complete an interpretive center and nature walks. The biggest problem, land ownership, is still unresolved. Sixteen square miles are in private holdings and 22 are administered by the Bureau. The Committee and the Conservancy have raised funds to purchase 2¼ square miles, and the Conservancy has just assisted in a government land exchange to acquire another 2½ square miles. Eleven miles are left, and these remaining acquisitions are going to be long and difficult. There are over 400 property owners and most of the remaining parcels are quite small. Desert Tortoise Preserve Committee and Conservancy members look ahead to the day when the sanctuary is complete and the tortoise safe, in keeping with the motto on their T-shirts: "I may be slow, but I get there."

Lead Zoologist and Wildlife Biologist for BLM's California Desert Program, **Kristin Berry** is a dedicated conservationist. She is founder of the Desert Tortoise Preserve Committee, Inc., a member of the Board of Directors of the Conservancy's Southern California Chapter, and member of the Board of Directors of the Southern California Academy of Sciences. Dr. Berry was awarded a 1979 American Motors Award for her work with the desert tortoise and for her wildlife inventories in the desert.

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